

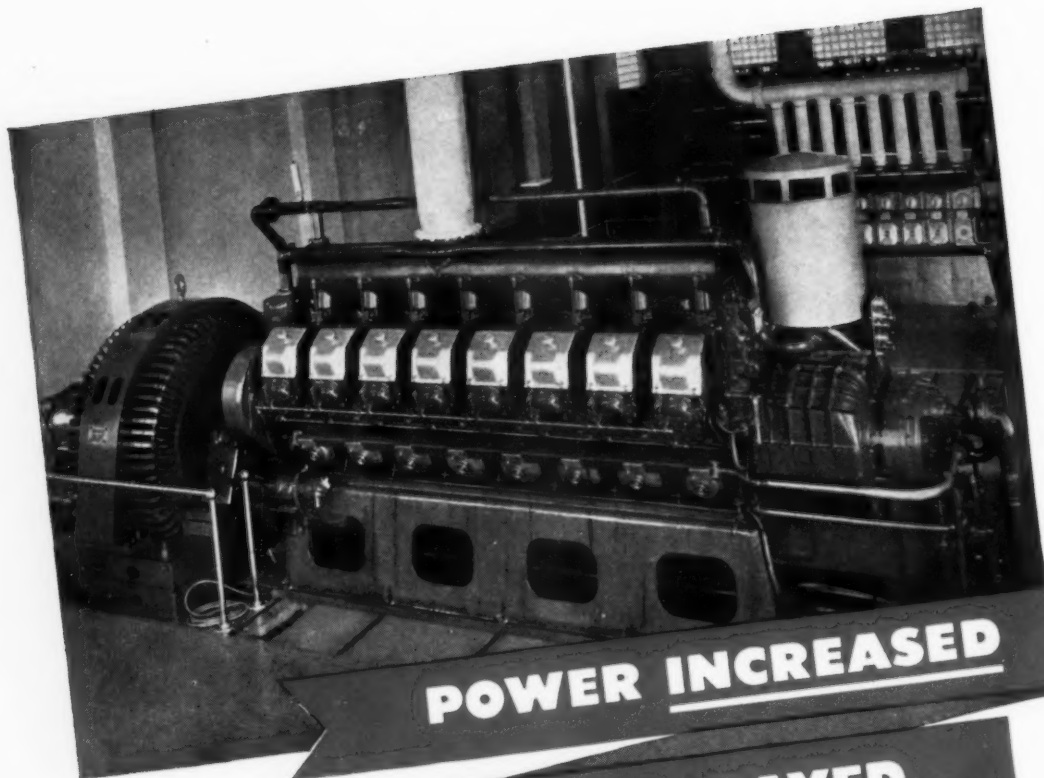
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DIESEL PROGRESS

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JANUARY, 1946
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FOR ALL DIESEL ENGINES

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON SUNDAY NIGHTS ★ METROPOLITAN OPERA BROADCASTS SATURDAY AFTERNOONS

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FRONT COVER ILLUSTRATION: First new post-war tug to appear in New York Harbor, "Turecamo Boys," is the latest addition to B. Turecamo Construction Company, was built by Jakobson Shipbuilding Company and is powered with General Motors 800 hp. Diesel.

TABLE OF CONTENTS ILLUSTRATION: Levee construction near Claryville, Missouri, goes on night and day with Caterpillar Diesel earth moving equipment and portable lighting units such as seen here.

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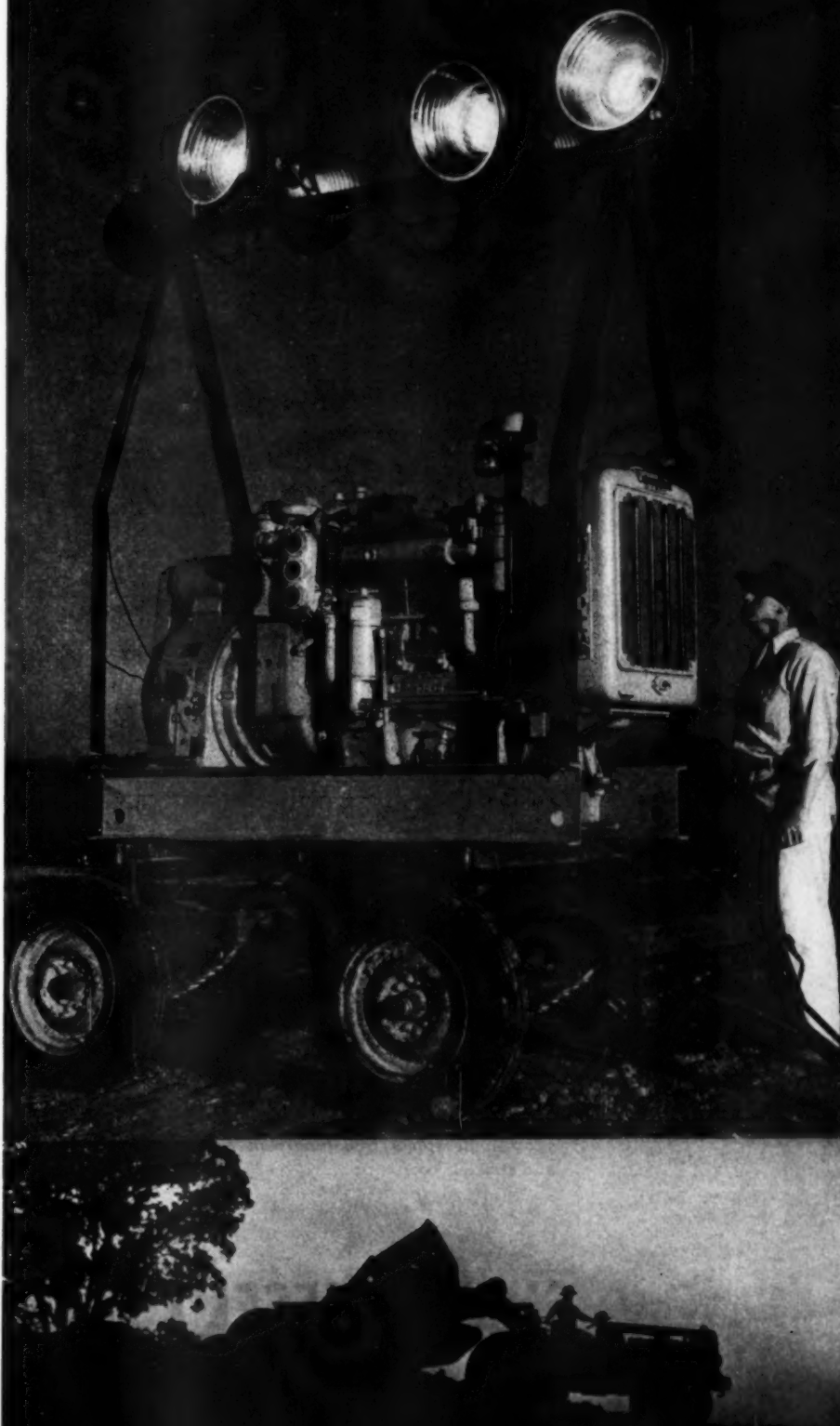
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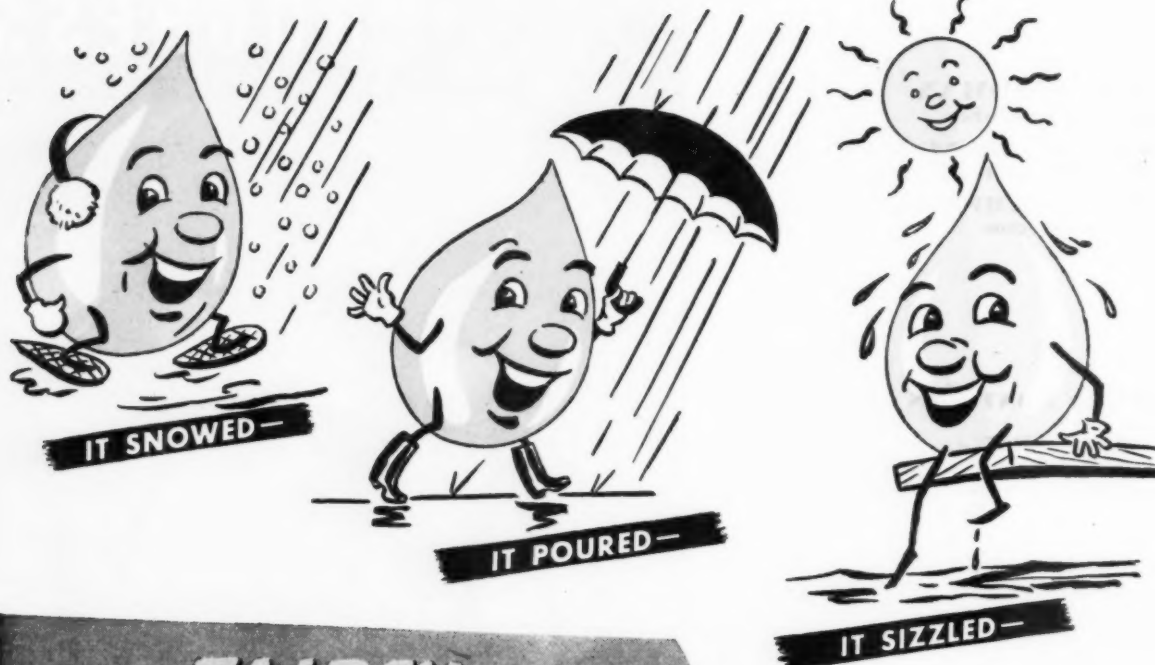
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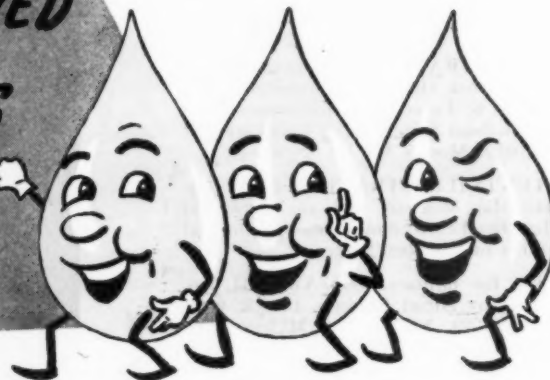
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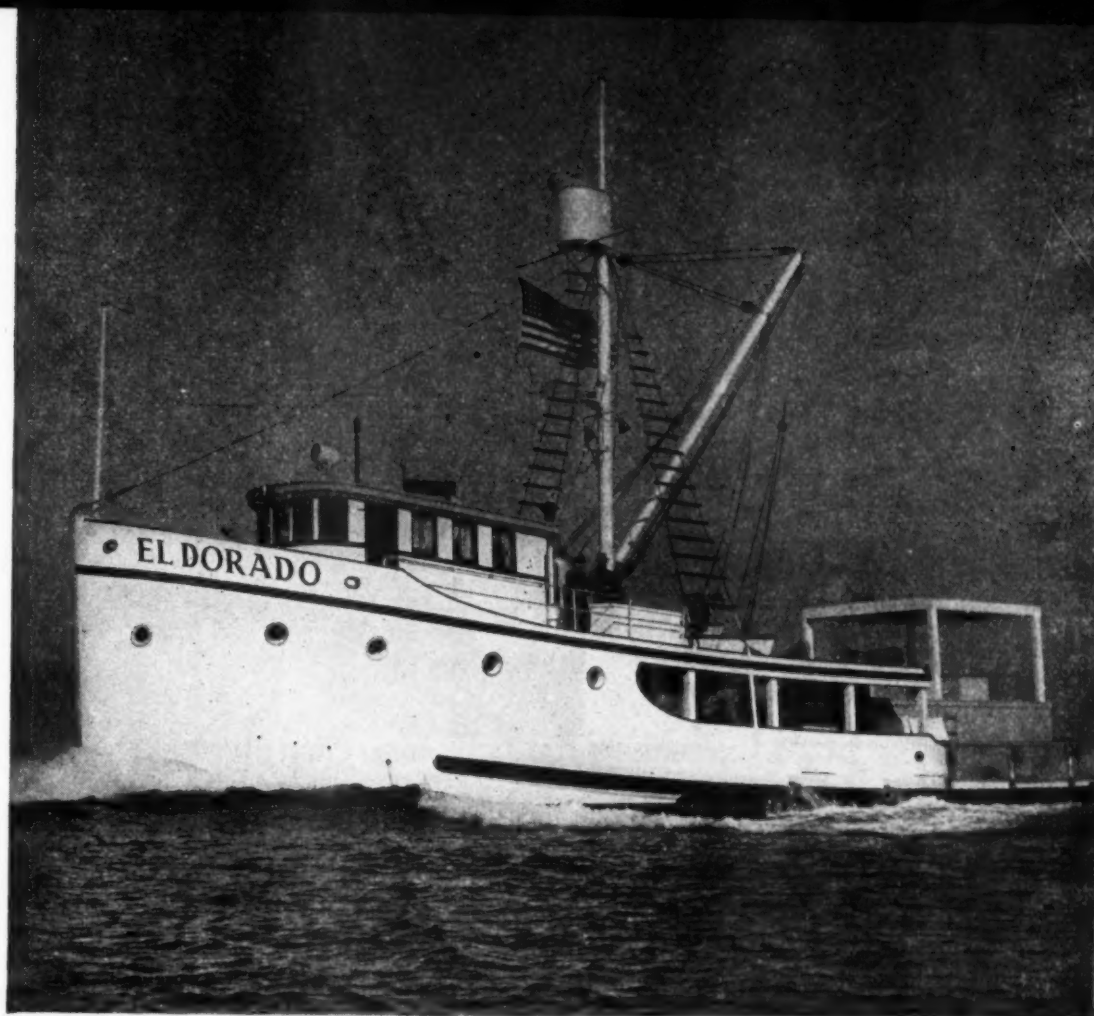


PLYWOOD AND DIESEL FISHERS

By CHARLES F. A. MANN

TWO unique fishing vessels have left Puget Sound for the far reaches of the Pacific Coast—one to fish for tuna and the other for sardines. These two ships, completed but two weeks apart at the busy yard of Peterson Boat Building Company, Tacoma, are destined to make more fishing history, for they both employ the most extensive use of Douglas fir plywood ever used in both fishing vessel types—the *El Dorado*, a "Baby Tuna Clipper" and the *Marauder*—a so-called "Giant Type" of sardine seiner. To be specific, literally thousands of square feet of Super-Harboard, a unique type of 100% waterproof thick plywood composed of pressure-integrated layers of long-grain Douglas fir veneer and waterproof plastic, that comes in sheets 1½ in. thick, six ft. wide and up to 28 ft. long, a product of famed Harbor Plywood Corporation of Aberdeen, Wash., went into these two entirely different types of coast fishing vessels; built by the same people and for two different sets of owners, but both powered by Enterprise Diesel engines. The *Marauder* carries a 400 hp. 6 cylinder Enterprise while the *El Dorado* despite her heavy load of refrigeration equipment, to save space in the engine room, carries a 250 hp. 6 cylinder Enterprise Diesel.

The *El Dorado* is 79 x 20 x 11 ft. and is so loaded down with auxiliary equipment, it required a unique treatment of spacing to stuff it all aboard. This "Baby Clipper" is a 130 ft. tuna clipper in miniature, and besides being compartmented into 8 refrigerated holds, mostly of plywood construction—the first time tuna tanks have been built of plywood—her entire upper deck and deckhouse structure is of plywood inside and outside; so are the bulkheads throughout the ship and even the roof of the



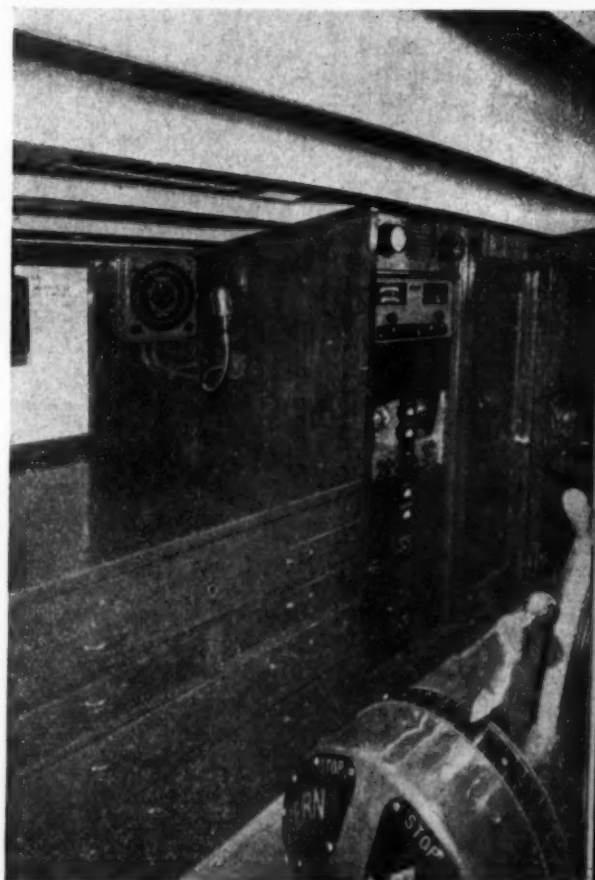
The 79 ft. all-Diesel and plywood "Baby Tuna Clipper" "El Dorado" on trial run.

All photos in this article from Turner Richards Studio

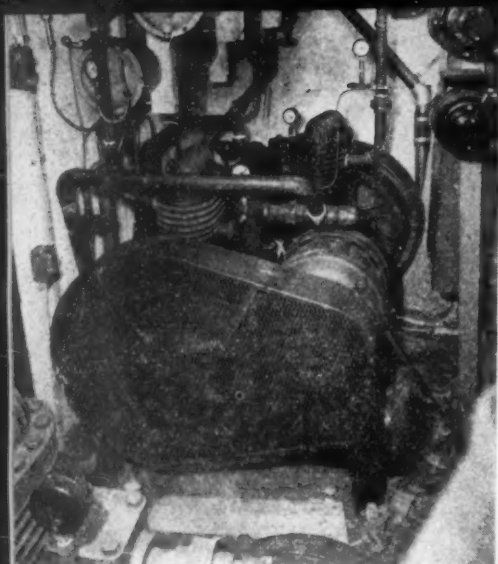
pilot house and the solid guard rail in front of the "outside" pilot house.

And when a group of 5 partners invest \$130,000 in a novel creation of somewhat radically different design, based on the lightweight, very strong properties of huge single sheets of Super Harboard, and load it down with 7,000 ft. of 1 inch galvanized, welded brine coils in the 8 tuna tanks; 3 Diesel engines; 3 ice machines and some 20 motor driven pumps—all in a hull no larger than a medium size purse seiner, it is no wonder that such wide interest has been developed in this novel ship.

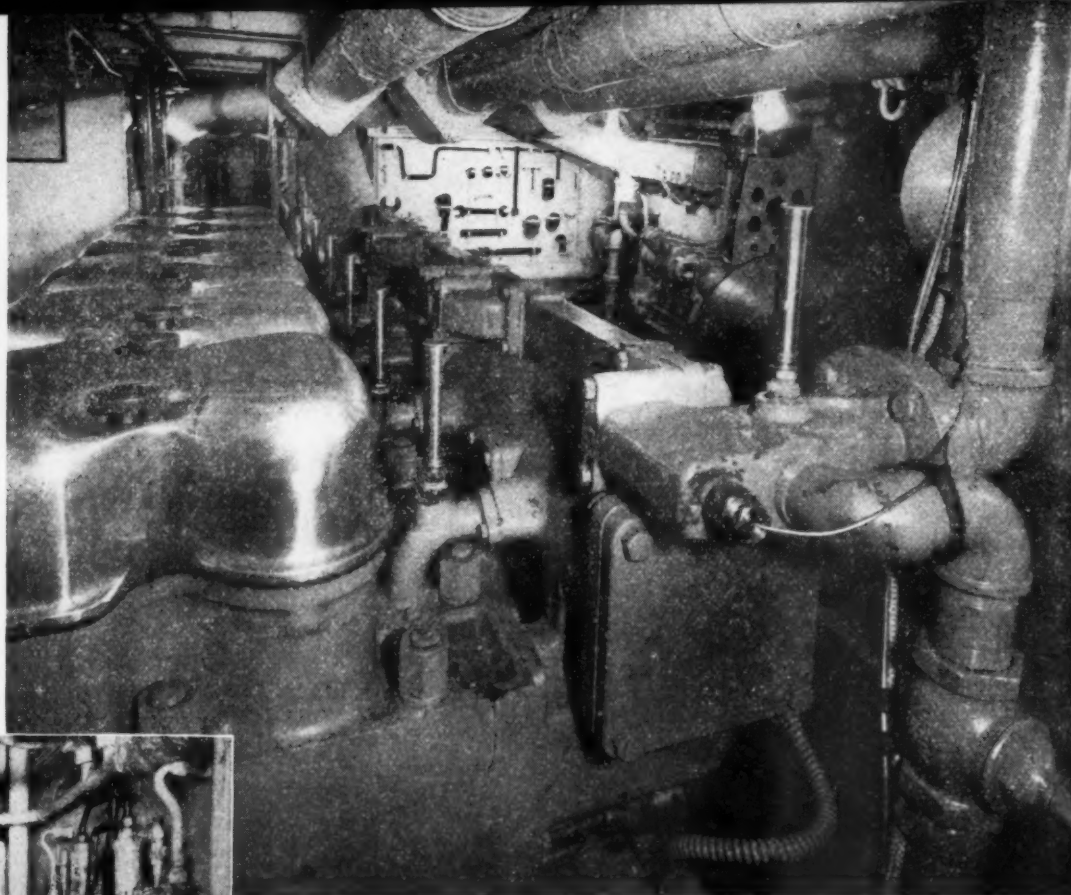
El Dorado is owned by Messrs. Roy and Harold Sundquist, Andy Isacson, Fred Diamond and George Peterson, youthful head of the company that built the vessel. It will carry 105 tons of frozen tuna in the 8 holds below decks, two of which are steel lined for supplemental Diesel oil storage on the outbound voyage; and the two bait boxes on the after main deck. It is also the first tuna vessel to carry a 100% Freon gas refrigerating plant. *El Dorado* again busts tradition by, for the first time on record, providing fancy 2-man staterooms for the crew of 11 men, with a single room for the Captain.



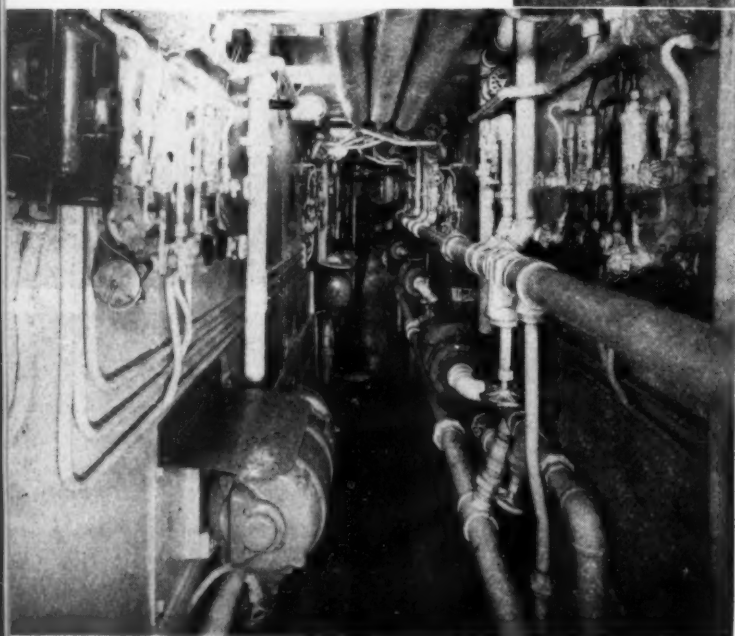
Even the pilot house, where Radio and Fathometer are installed, is finished with mahogany plywood.



View shows two of three York Freon refrigerating compressors on the "El Dorado."



View over top of main, 250 hp. Enterprise Diesel. Seen, right rear, is one of the two Bardco auxiliary units with Chrysler 80 hp. Diesel.



View looking aft in the shaft alley, between tuna tanks on the "El Dorado."

Owners of the "El Dorado," left to right: George Peterson (also President, Peterson Boat Building Co.), Fred Diamond, Andy Isacson, Harold Sundquist and Ray Sundquist.



EL DORADO

instead of the "Bull Pen" dormitory. These five able gentlemen of Tacoma have smashed most of the fishermen's traditions with this boat . . . not to mention that a shower bath has been fitted, at long last, on a fishing vessel that supplies both hot and cold fresh as well as salt water. A cold salt shower has been sufficient heretofore. But not on *El Dorado*.

To support the cram-packed machinery list, the hull is heavily flared forward, to almost barge or houseboat proportions. Tank space is provided for 14,000 gallons of Diesel fuel, in a forward, 2 wing and 2 aft tanks and 2 steel-lined fish wells directly back of the engine room. Fresh water capacity is 2100 gallons—large, despite the lack of space. The engine room carries the main 250 hp. Enterprise Diesel and two 80 hp. Bardco-Chrysler Diesel auxiliary sets, each driving a 50 kw. Bardco 220 volt 3 phase A.C. generator—all electrical gear on the boat is alternating current. The whole machinery space is so far forward that the hull is flared below the water to almost a bulbous bow. The whole machinery space is directly below the pilot house.

The main Diesel has the usual Weston Tachometer and Alnor Pyrometer installation, duplicated in the pilot house. Main engine controls are beside the Diesel in the engine room and, in the inside pilot house. After the engine room, comes the long shaft alley pump and manifold chamber, with its array of pumps and

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valves which form a sort of auxiliary engine room. On each side of this passage are the tuna tanks, each with dual flood lights to keep the live bait from suffocating in one huge mass atop each tank, which would happen if lighting was not supplied. Circulating water mains, brine controls, thermometers and light switches, match the layout of compact vertical centrifugal pumps that line this passage. Bulkheads which form the tuna tanks are, as outlined, all plywood, and insulated with cork, and specially painted inside. Ten 2-inch Pacific Electric pumps are used for seawater circulation in the bait tanks, bilge, fire and condenser service, as well as transfer service to keep the ship on an even keel as live bait is drawn off and dry, frozen storage provided for the fresh caught tuna. Two 6 x 8 inch Pacific vertical bait pumps maintain seawater circulation for each space where live bait is carried. Three 1 1/4 in. Pacific pumps supply the heat exchangers used on the Chrysler Diesels. A Doran propeller, driving through a bronze tailshaft is fitted. A 3-bottle Kidde CO2 system is provided. Square D switchboxes are provided everywhere. Two 22 in. x 84 in. air bottles are fitted. In a tiny transverse compartment, forward, on the main deck, are three 10 hp. York Freon pumps, to supply the entire ship.

An oil burning galley range with hot water coils; a large built-in ice and frozen food box and roomy working spaces marks the galley. Four 2-man staterooms on the main deck and one 2-man and one 1-man stateroom on the upper deck are provided for the crew, each with roomy lockers, drawers and wash basin. Marbled Raecolith magnesite flooring is used directly over the thick plywood flooring throughout the interior of the ship, including galley, staterooms, pilot house and shower-toilet room, instead of linoleum.

Navigational equipment is of the most elaborate ever fitted on a Baby Clipper. A 6s Intervox direction finder; a Submarine Signal fathometer; a 250 watt 2-way Northern Electric radio telephone set and a 35 mph. speedboat is provided. The entire elaborate AC electric layout of the ship was sub-contracted to the Ault Electric Co. of Tacoma, which enabled this firm to adapt shoreside alternating current practices commonly used in industrial and commercial enterprises, with 100% good results, to a Baby Tuna Clipper—another "first" for this interesting little—but—big fishing ship.

Sardiner "Marauder"

Approximately halfway through the "works" on El Dorado, Mr. Peterson begins to grow almost

as enthusiastic over this plywood loaded different type of fishing craft, built for Messrs. John and Paul Puratich as he did over the tuna ship he constructed for himself and his 4 Tacoma partners.

Again it is not amiss to remind our readers of the much simpler, roomier characteristics of a seiner versus a tuna clipper. In the latter you have to load the boat down with an elaborately controlled tank-storage system for live bait and frozen tuna, provide a Diesel auxiliary power plant for it, and provide for 3-7,000 miles of travel at sea. In the same size hull, a seiner will carry twice the fish on short runs, and doesn't need refrigeration.

Marauder is 86 x 22 x 11, and likewise makes use of Douglas fir waterproof plywood (Super Harboard) on upper decks, deckhouse, bulkheading, etc. To further adapt this craft for other than sardine seining, a Northern dragger was installed for use in drag fishing.

The power plant is a 400 hp. 6 cylinder Enterprise Diesel, with a Bardco auxiliary unit using a Chrysler Diesel of 83 hp. hooked up to the usual elaborate lineshaft drive for all auxiliaries.

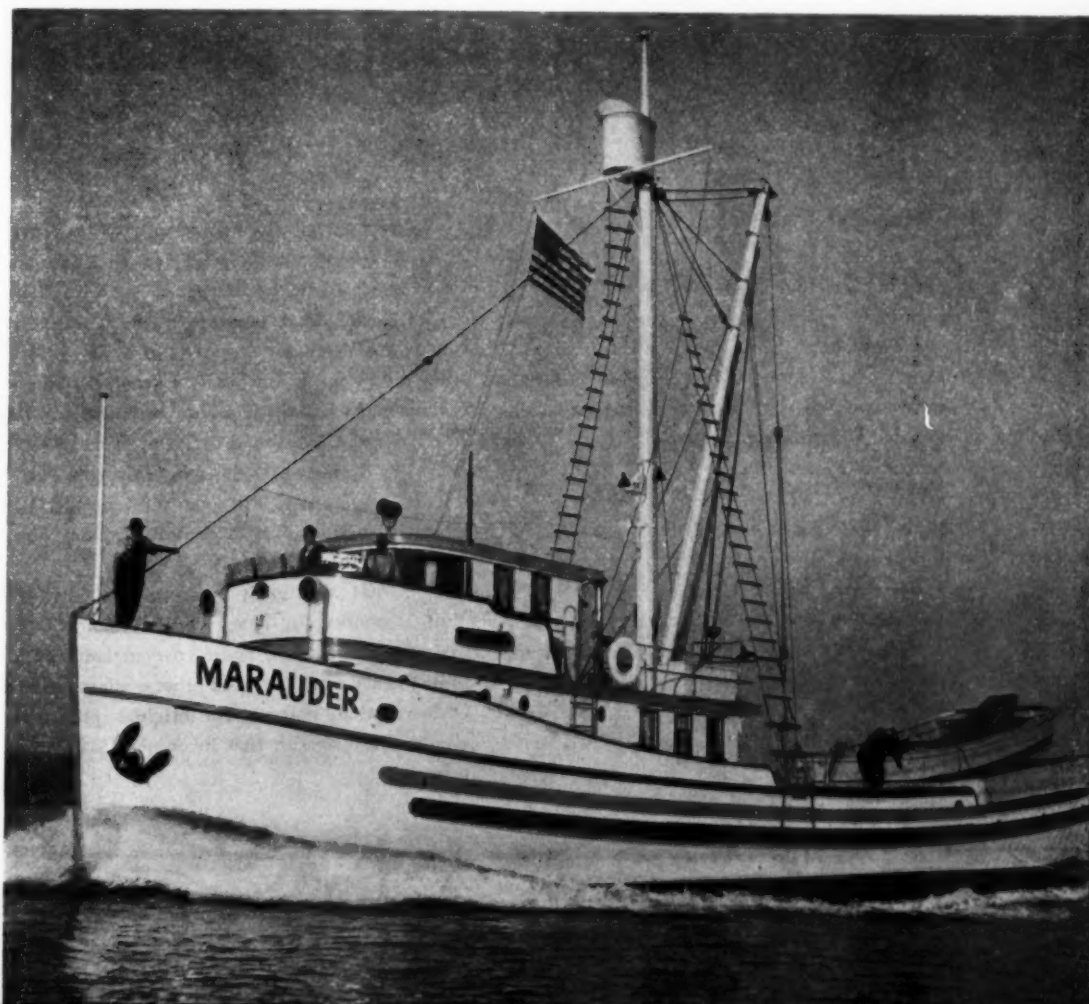
A Quincy air compressor; a lineshaft for the dragger and anchor winch: two 3 in. Fairbanks-

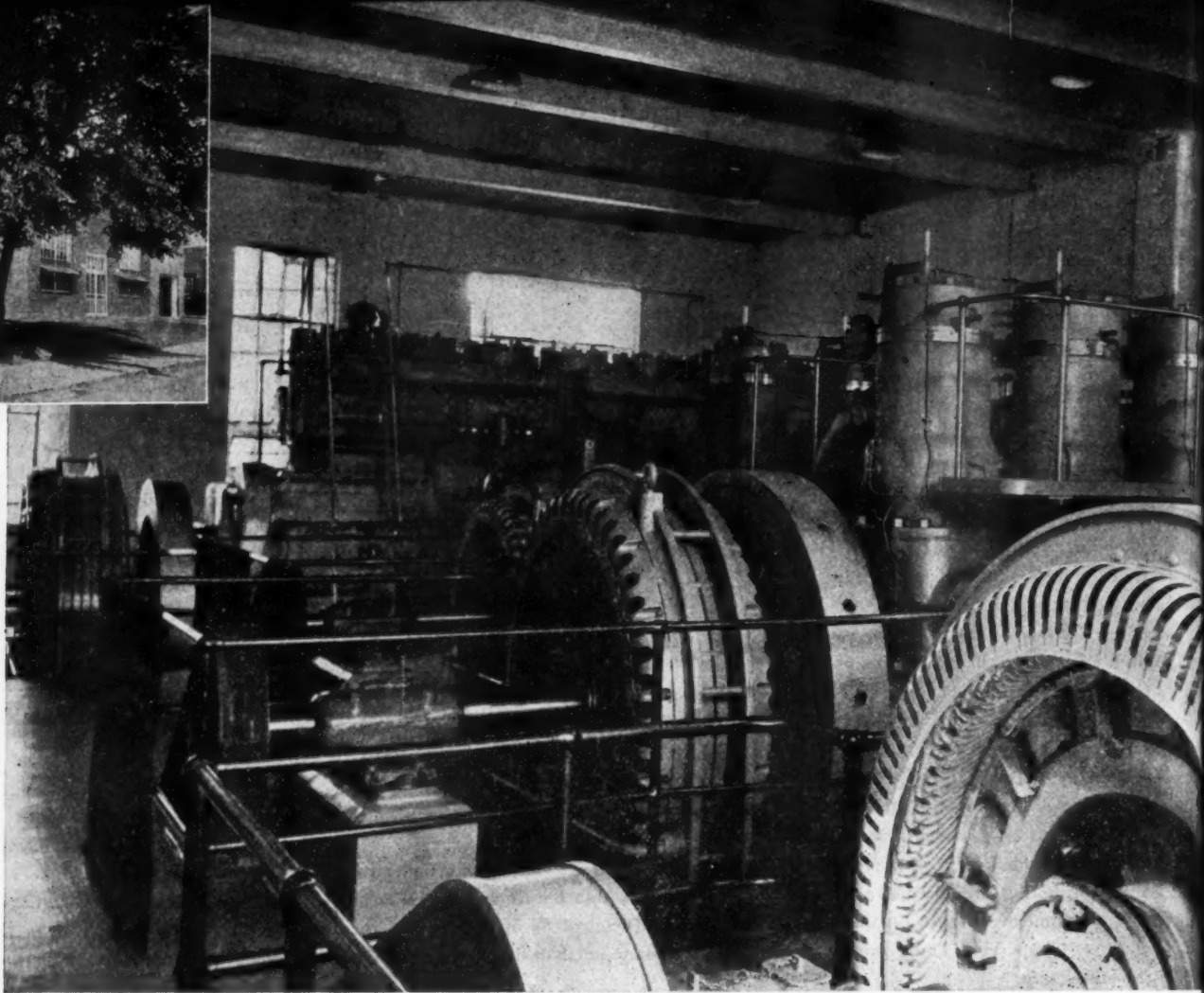
Morse fire and bilge pumps and a 3 kw. Westinghouse auxiliary generator all are chain or v-belt driven through clutches, from this lone Chrysler Diesel. Another 3 kw. Westinghouse belt driven generator works off the main engine, both supplying a 110 volt Willard battery set. A Doran propeller is fitted, and double pilot house control, for the inside and outside pilot house, are fitted.

A twelve man crew is carried; one compartment holding 5 and a second holding 6 and a captain's room aft the pilot house. Intervox direction finder and a 65 kw. two-way radiophone are provided as well as a Submarine Signal fathometer. This ship will tote 190 tons of California sardines when fully loaded.

So when you hear about the "postwar fishing vessel" built of plywood, as a thing to contemplate in the future, forget it. It's practically here. The only step to take in a 100% plywood fishing vessel is to find some way to get a 2-way "bend" on the big thick sheets so you can wrap up a husky fir ships frame with the stuff, and create, at last, a boat of wood far stronger than steel. Such a ship would be practically as rigid as a steel casting, and far lighter than a ship of wood framing and cut planking. This new day of plywood and Diesel is just around the corner.

The 86 ft., 400 hp. Enterprise Diesel-engined seiner, "Marauder," on trial run.





Insert, upper right, shows exterior of the Mora, Minnesota, power plant. Above are seen the three Fairbanks-Morse Diesel-generating sets, the fourth unit being a Worthington, 500 hp. Diesel driving the E.M. generator seen lower right.

VILLAGE-OWNED DIESEL PLANT

Braves Future by Doubling Capacity

By T. J. MALONE

NOVEMBER ninth, 1945, was a day of moment to the village of Mora, Minnesota. The date marked the tenth anniversary of the beginning of operation of its municipal Diesel electric plant. It invited a pointing-with-pride to a modern, amply equipped plant and to a notable pay-off record, along with satisfactory service and reasonable rates to light and power consumers.

When Mora replaced high-line transmission service by a municipal generating plant, it had a population of 1,014. The estimate is 1,800 today. The high-line utility had succeeded a privately owned steam plant supplying electricity.

The village installed, to begin with, two Diesel

engines, one of 210 hp., three cylinders, and one of 280 hp., four cylinders, both Fairbanks, Morse units, with alternators and auxiliary equipment. In September, 1938, it added a 500 hp. Diesel, six cylinders, made by Worthington Pump & Machinery Corporation. The three units had a combined horsepower of 990 and a rated kilowatt capacity of 669. While a fourth engine, a 1,000 hp. Fairbanks-Morse Diesel, was put in this year, let's consider just now what those first three units did for Mora.

The total investment in the electric plant as of December 31, 1944, was \$167,263, without depreciation. That figure covered land, building, heavy machinery and other equipment, and distribution system—both original plant and additions. Against that investment \$123,505 in

bonds had been issued. Plant earnings had retired all the bonds before the end of 1944. Earnings had paid also, as the years passed, the difference between investment and bond debt, as well as interest on the latter. The plant was wholly clear of debt after nine years. Total operating profit for the nine years was \$200,966, not including free services. Additional cash surplus was \$15,089 as 1944 closed.

Then what? The plant's peak load in 1944 had been 520 kilowatts, against its 669 kw. capacity. In the light of expected increase in demand for energy after the war, that reserve of 149 kw. called for upping.

Last April the 1,000 hp. Diesel was added, a five-cylinder, with "fixin's." This doubled the

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Year	1935-1936	1937	1938	1939	1940	1941	1942	1943	1944
1935-1936	1	1	1	1	1	1	1	1	1
1937	1	1	1	1	1	1	1	1	1
1938	1	1	1	1	1	1	1	1	1
1939	1	1	1	1	1	1	1	1	1
1940	1	1	1	1	1	1	1	1	1
1941	1	1	1	1	1	1	1	1	1
1942	1	1	1	1	1	1	1	1	1
1943	1	1	1	1	1	1	1	1	1
1944	1	1	1	1	1	1	1	1	1

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horsepower, making the total 1,990. It raised the combined kilowatt capacity of 1,362—by units: 138—186—345—693. This gave a reserve of 842 kilowatts.

But what will the plant do with all that reserve? Go easy, brother, it will need it in the coming years. Besides the pent-up demand of homes and small businesses for more and still more energy, Mora's major industries have plans for expansion. These industries include a large creamery, a milk dehydrating plant, a machine shop making milk dryers, two feed mills. The old, temporary dehydrating plant will be replaced by a new and larger one. A county hospital now being built—Mora is a county-seat town—will require electric service. Also a farmers' cooperative association of some 200 members operating a rural distribution system, not REA, will want more juice from the municipal plant. The association plans extensions and new subscribers. The rural service is given through six master meters at the ends of village lines.

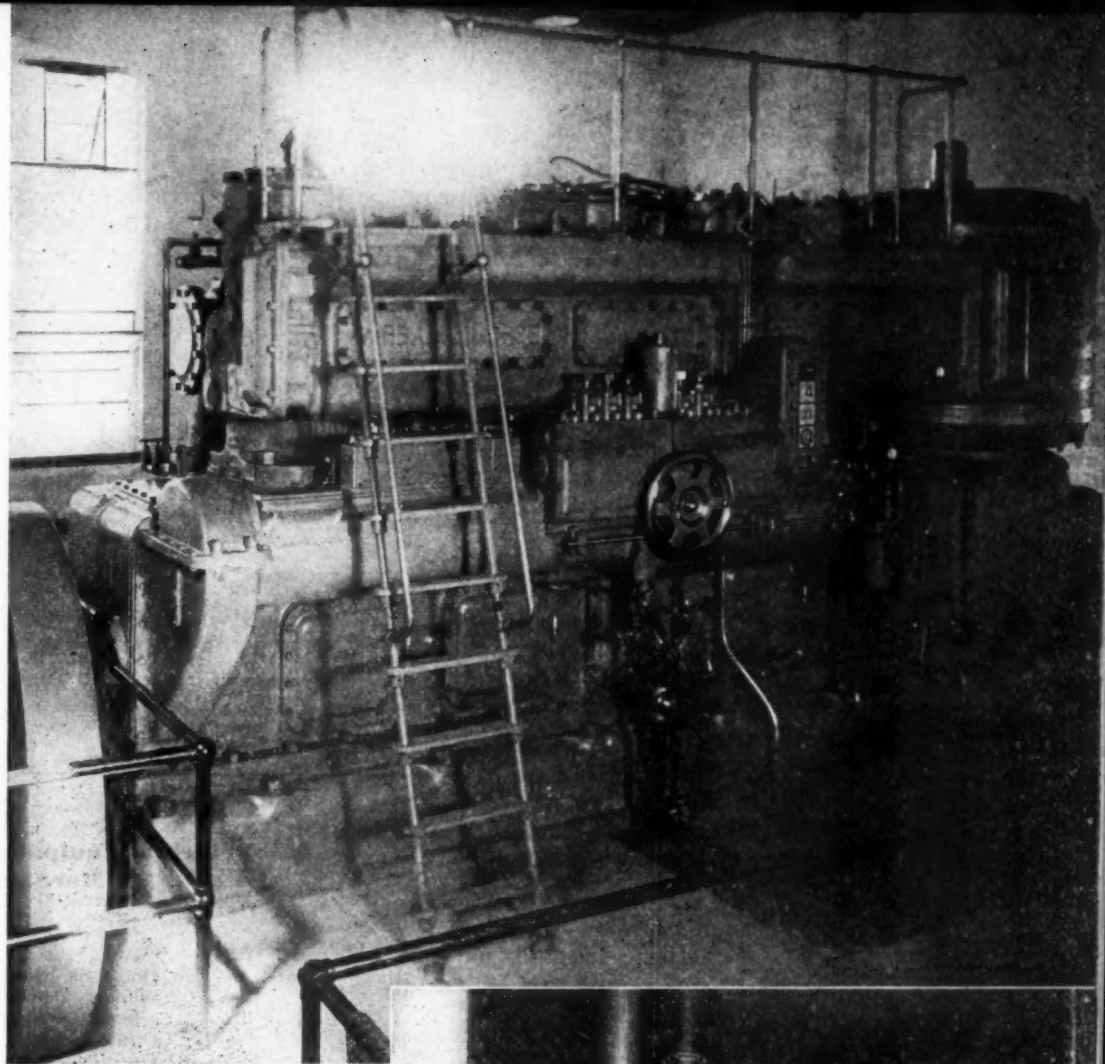
How did the addition of the big engine, together with incidental building changes and extensions of the village distribution system, affect the financial picture? These improvements cost the plant \$105,649. Toward meeting this cost, \$66,000 in revenue bonds were issued. The remaining \$39,649 will be paid this present year from that \$15,089 surplus plus current earnings.

Earnings will be drawn on for more than that. They made possible a payment, on July 15, of \$2,000 on the new bond debt and are expected to provide payments of \$2,000 a month until all bonds are retired. All are callable after the first year. Full pay-off is looked for in less than two and a half years.

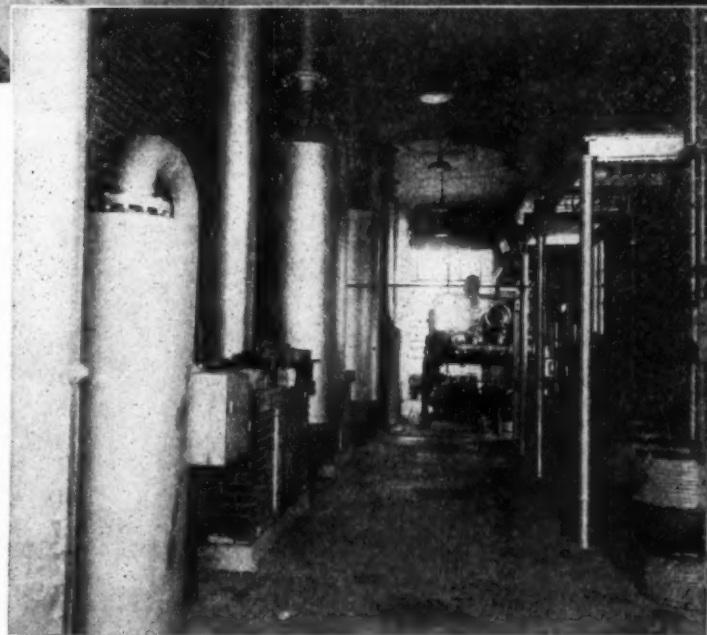
Key data on—but, first, the total investment in the plant (valuation), without depreciation, stood at \$272,912 on August 1, 1945. Key data on plant performance follow for fiscal years, December 10 to December 9 inclusive for the first seven and November 19 to November 18 inclusive for the other two:

Year	KWH generated	KWH per gal. of fuel oil	Av. KWH cost del. to consumer	Av. revenue per KWH	Maintenance-repair cost per hp.
1935-1936	663,990	10.90	\$.0199	\$.0489	\$.117
1937	747,480	11.24	.0165	.0458	.186
1938	855,520	11.15	.0160	.0423	.302
1939	1,015,570	11.29	.0153	.0391	.292
1940	1,174,910	11.07	.0138	.0371	.301
1941	1,325,300	12.20	.0133	.0324	.414
1942	1,642,320	12.50	.0117	.0300	.243
1943	1,826,710	12.50	.0121	.0289	.434
1944	1,950,710	12.60	.0116	.0286	.087

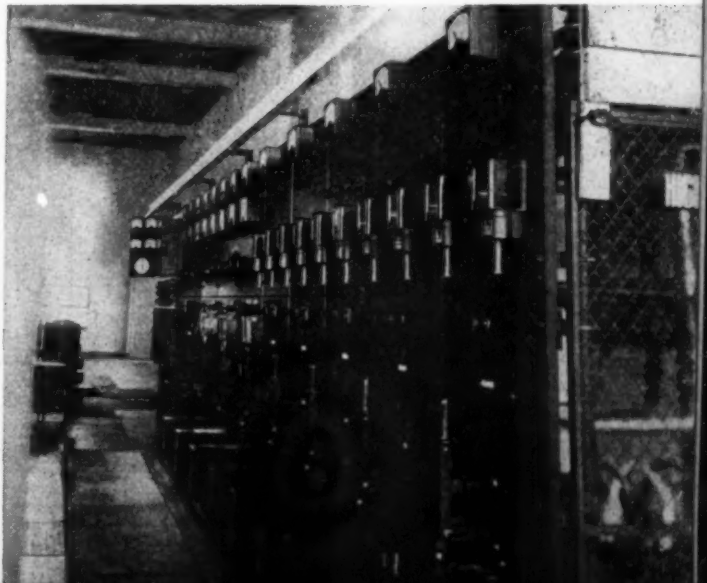
Maintenance-repair costs per horsepower for the full nine years level off to 28 cents a year,



Largest engine in the plant is this F.M. Diesel of five cylinders, 1000 hp. at 300 rpm. Note Madison-Kipp lubricator, left center, also Woodward governor and Purolator fuel filter, right center and Honan-Crane lube refiner, extreme right.



Exhaust silencers are two each, F.M., Maxim and Burgess. Cooling water circulating pumps and heat exchangers are seen, center background.



The G.E. switchboard includes one station panel, four feeder panels, four generator panels, one voltage regulator panel and an alarm panel.

as computed by prorating horsepower. Edward R. Kent, superintendent of the plant from the beginning, believes his items of maintenance-repair cost and line loss are of major significance, along with the other data given, as indicating performance. Close and frequent attention to transformers is what keeps the line loss down to an average of 7.66% of total energy distributed.

In taking over from the utility service, the Mora commission adopted the utility's rates then in effect and continued them until it got its bearings. On March 1, 1938, it set up a general rate reduction of about 14 per cent. The next general rate reduction went into effect on January 1, 1941. That schedule obtains today.

The top rate in the residential classification at the outset was 8 cents a kilowatt hour. It dropped to 7 cents and then to 6.5 cents. The bottom rate decreased from an initial 3 cents to 2.5 cents and then to 1.5 cents. The residential rates now, net, are:

First 40 kwh., 6.5c; next 60 kwh., 3c; next 50 kwh., 2.5c; next 200 kwh., 2c; excess, 1.5c. The minimum monthly charge is \$1.00.

Net energy charges on specific consumptions for residential uses and commercial lighting, based on rates put into effect in the years as stated, follow:

	RESIDENTIAL Lighting, refrigeration, stove, etc. KWH					COM- MERCIAL Lighting KWH	
	15	25	40	100	250	100	250
1936	\$1.20	\$2.00	\$3.20	\$5.00	\$9.50	\$7.75	\$17.00
1938	1.19	1.75	2.80	4.60	8.35	6.75	14.75
1941	1.00	1.62	2.60	4.40	7.65	6.12	12.87

It has been stated that average revenue per kilowatt hour was \$.0489 in 1936 and \$.0286 in 1944. How the various classifications fared in the decrease is presented in this breakdown:

	Residential	Commercial lighting	Commercial heating	Primary power	Secondary power	Rural	Municipal	Water heating
1936	6.33c	7.2c	3.2c	2.2c	6.1c	3.26c	.74c	1.04c
1944	4.33	4.1	2.4	1.8	2.4	2.13	.68	1.03

Residential consumption topped the list for energy use in 1944, with secondary power a close second. Here is the tally, the per cent's being of total amount consumed:

	KWH volume	Per cent
Residential	371,700	21.9
Commercial lighting	294,031	17.4
Commercial heating	60,687	3.5
Secondary power	327,652	19.4
Primary power	197,300	11.7
Water heating	174,613	10.3
Rural	166,186	9.2
Street lighting and village pumping	97,544	5.8
	1,689,713	99.2

Station use, 128,805 kilowatt hours, or 6.6 per cent of gross energy produced, and line loss.

132,192 kwh., or 6.8 per cent of energy delivered to the distribution system (gross less station use), make up the over-all generation total of 1,950,710 kwh. for the year.

Operating expense of the plant has run about 40 per cent of operating yearly receipts. These figures are typical:

	Operating Receipts	Operating Expense	%
1936	\$26,867	\$10,948	40.6
1939	33,272	13,089	39.8
1944	47,425	19,687	41.5

The year 1939 is chosen as that was the first year of full operation of all three Diesel units.

The plant gives numerous free services. They include lighting of the streets and of fire de-

partment quarters, of municipal office (council and clerk), municipal garages (for street department and fire department vehicles), municipal library, municipal jail, the chapel in the municipal cemetery and a youth center housed in a building owned by the village and operated by a private volunteer group. The value of these "donated" services has ranged from \$2,100 to \$3,069 yearly, with an average of \$2,554.

Members of the Municipal Utilities Commission are Frank J. Gorham, J. C. Thies and C. O. Dresser. The commission directs operation of the electric plant, the water department and the sewage disposal plant. Mr. Kent is superintendent of the disposal plant as well as the electric. The village council operates the distribution phase of the sewerage system.

Principal Equipment Municipal Utilities Mora, Minnesota

Electric Plant

Diesel engines:

One three-cylinder, 210 hp., 300 rpm., Model 32E14; one four-cylinder, 280 hp., 300 rpm., Model 32E14; one 1,000 hp., five-cylinder, 300 rpm., Model 33F16—all by Fairbanks, Morse & Co. One six-cylinder, 500 hp., 360 rpm., Model DS-6, by Worthington Pump & Machinery Corporation.

Governors:

Woodward Governor Company.

Generators:

One 172 kva. alternator with belt-driven 7½ kw. exciter, one 235 kva. with 7½ kw. belt-driven exciter, one 875 kva. with 15 kw. belt-driven exciter—all Fairbanks, Morse & Co.; one 431 kva. with 10 kw. belt-driven exciter, by Electric Machinery Mfg. Co.

Switchboard:

General Electric Co. One station panel, four feeder panels, four generation panels, one voltage regulator panel, one alarm—11; also one blank.

Water pumps:

Two 250 gpm., one Fairbanks-Morse and one Worthington; two 500 gpm. Fairbanks-Morse; all centrifugals, all 70-foot head.

Cooling tower:

Two Lilly-Hoffman, one induced draft and one forced draft.

Silencers:

Two Fairbanks-Morse; two Maxim; two Burgess.

Air filters:

American Air Filter Co. 4 SCF.

Air compressors:

Two Fairbanks-Morse single-stage, one gasoline-engine driven, one motor-driven.

Fuel oil pump:

One Fairbanks-Morse.

Pyrometer:

Alnor.

Distribution transformers:

One Line Material Co., one General Electric, one Uptegraff.

Distribution meters:

Duncan, Type MF-A, 598 for muny plant, 200 for rural.

Lube oil purifiers:

One Diesel Service Co.; two Honan-Crane.

Fuel oil meters:

Three Hersey Mfg. Co. and one Worthington-Gamon.

FAIRBANKS- MORSE- HOST

FAIRBANKS, Morse & Co. was host on November 30 to 15 instructors in Diesel engineering, who came from eight states to tour its plant at Beloit, Wisconsin, and hear short addresses by company officials. Object of the session was to provide the college and university professors a "close-up" of Diesel engine manufacture, to the end that such first-hand knowledge would enable them to improve their classroom and laboratory instruction.

On the speaking program were A. C. Howard, General Manager of the factory; Henry J. Barbour, Program Chairman and Manager of Fairbanks, Morse's Sales Promotion; V. O. Harkness, Manager of General Diesel sales; H. M. Haase, Assistant Factory Manager; W. W. Schettler, Chief Engineer of the Diesel Division; T. M. Robie, General Diesel Sales Division; Gordon Murphy, Chief Engineer Diesel Development and Experimental Division, and Harvey T. Hill, Executive Director of Diesel Engine Manufacturers Association.

The latter organization has been cooperating with its member companies in their arranging for engineering instructors to spend a day in their factories and research laboratories.

Among the instructors who attended were the following:

Prof. W. M. Richtmann, Colorado School of Mines, Golden, Colo.; Prof. W. S. Beatie, University of Colorado, Boulder, Colo.; Professors J. C. Miles and B. F. Larson, University of Illinois, Urbana, Ill.; Prof. Daniel Roesch, Illinois Institute of Technology, Chicago, Ill.; Prof. J. M. Trummel, State University of Iowa, Iowa City, Ia., and Prof. Robert B. Rice, North Carolina State College of Agr. & Engr., Raleigh, N. C.

Professors B. H. Jennings and E. F. Obert, Northwestern University, Evanston, Ill.; Prof. L. L. Amidon, South Dakota State College, Brookings, S. D.; Professors L. A. Wilson and P. L. Myers, University of Wisconsin, Madison, Wis.; Messrs. Marcus Maynard and Arthur Sandberg, The William Hood Dunwoody Industrial Institute, Minneapolis, Minn., and Prof. R. E. Gibbs, Montana State College, Bozeman, Mont.

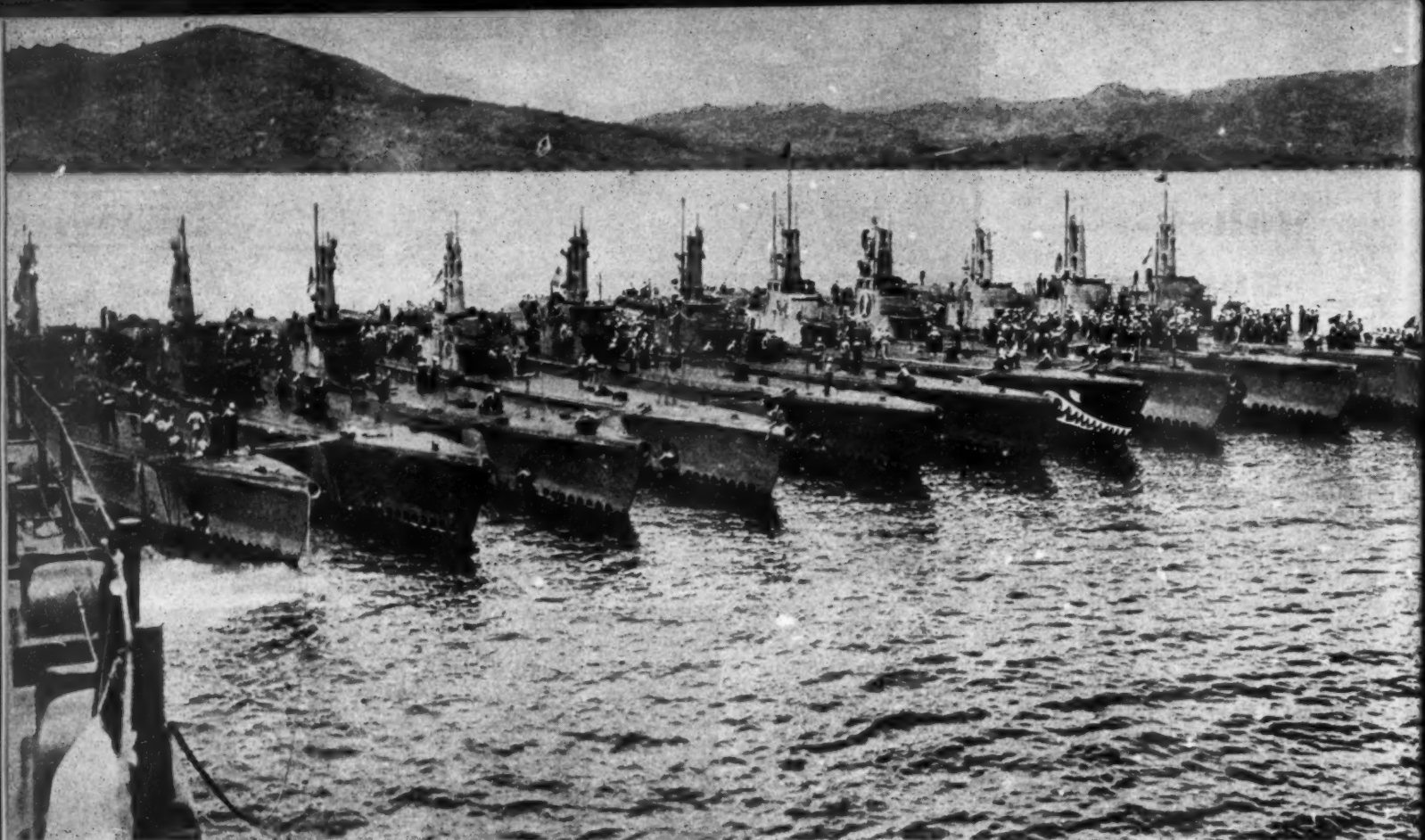
Left to right: Professor Gibbs, Mr. Clem of F-M, Prof. Roesch, Mr. Peterson, Prof. Miles, Prof. Larson, Mr. Newton, Prof. Richtmann, Mr. Schowalter of F-M.

Prof. Rice, Mr. Clausen of F-M, Prof. Wilson, Mr. Robie, Mr. Hill of D.E. M.A.

Prof. Trummel, Mr. Budzien of F-M, Mr. Maynard.

Prof. Richtmann, Prof. Larson, Prof. Amidon, Mr. Kutz of F-M, Mr. Sandberg, Prof. Obert and E. Hancock, operator of machine.





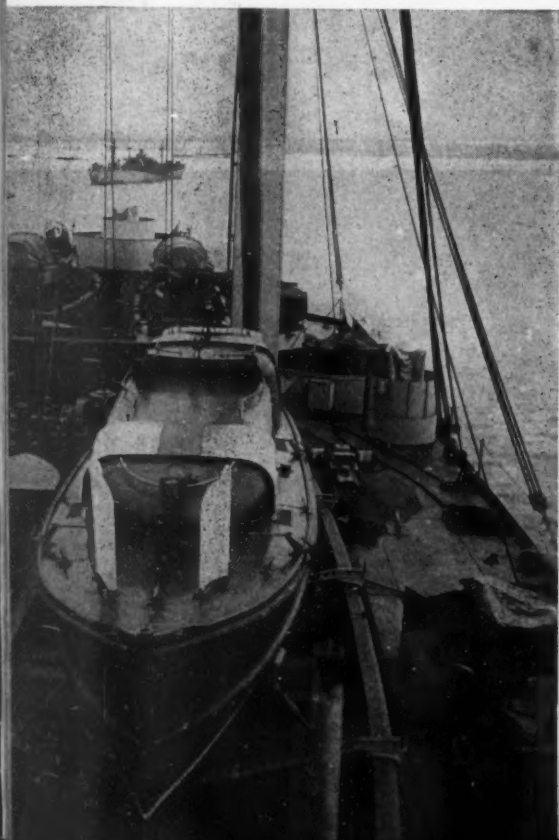
A sub-tender, extreme left, with her brood of submarines in the South Pacific.

MOTHER OF SUBMARINES

FEATURING MULTIPLE DIESEL-ELECTRIC GENERATION OF 15,380 H.P.

By WILBUR W. YOUNG

*Afterdeck of the "Howard W. Gilmore."
Note how all available space is utilized.*



TO fully appreciate the staggering facts, now publishable, relating to the erstwhile prosaic "Sub Tenders" of our vast Navy fleet a brief review of submarine activities against the Japanese in the Pacific furnishes an appropriate background. This "silent" arm of the service scored 1,041 commercial vessels sunk for an estimated total of 5-million tons—better than two-thirds of Japan's known shipping at the beginning of the war. Over and above that our submarines are credited with sinking 21 of the 63 major Japanese fighting craft known to have been sunk. To their credit also is the rescue of 504 American fliers who had little or no hope of surviving after forced landings at sea.

Back of such records lie endless acts of heroism—tireless devotion to duty and utter disregard for the limits of duty on the part of men who

serve under a code of their own—a code little known outside the supercharged atmosphere of the submarine itself. Missions extending over thousands of miles for seventy days and often more, with every nerve taut—with never a minute's relaxation, is only part of the price paid by these men for the glory with which they covered themselves. Words are weak graphics of such rigors—in any event the job belongs to poets and historians—but in some measure we may realize from the foregoing what a rendezvous with a mother ship means to submarine crews—yes even to the submarine itself for machinery gets tired too.

The submarine tender is in every sense a "mother ship," capable of receiving the weary crews of two divisions—500 men—giving them complete relaxation and recreation and patch-

ing up the servicing of every and every carries strength to intent and but precise "To provide personnel and tion to de is the inte neering pe same back, marine en tender's D 380 hp.—a specification which she of men a mean the defeat and

Typical of ized classes W. Gilmore noble hero "er down," the Japs. Navy Yard 529 ft. 6 in bination h shop is a structural engines ag engine roo ment she stores, sup exigencies and while a formidable feed her 1,110,766 g lube and 1 cold storag for a com commission not to me men—in fr South Sea tional faci 4,000 men

Three 5-to drives and installed fo conditions.

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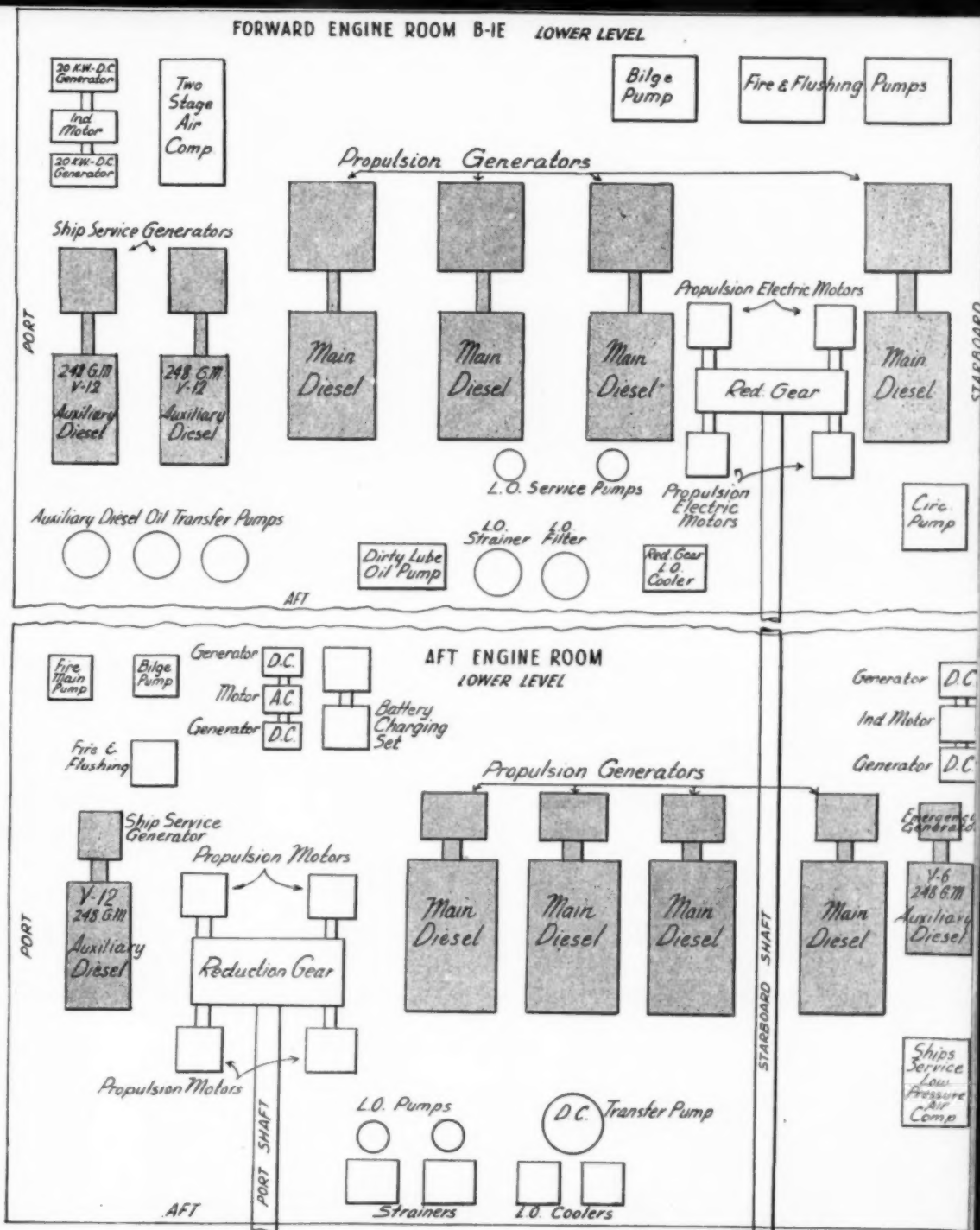
ANLAPY 1

ing up their battle scars while overhauling, servicing and repairing every item of machinery and equipment on the undersea craft. She carries complete relief crews of sufficient strength to man a Division, in fact the full intent and purpose of the sub tender is tersely but precisely stated in the Navy specification, "To provide efficient service to submarine personnel and material." In witness of close attention to detail in implementing the specification is the interesting fact that the tender's engineering personnel is made up of men with the same background and training as that of submarine engineers and even more pointed—the tender's Diesels—thirteen of them totalling 15,380 hp.—are of the same make and general specification as are those of the submarines to which she is assigned. Such interchangeability of men and machinery often can and does mean the difference between life and death—defeat and victory.

Typical of this, one of the most highly organized classes of ships in the fleet, is the *Howard W. Gilmore*—namesake of one of the war's most noble heroes whose immortal command, "Take 'er down," spelled the beginning of the end for the Japs. Built by Mare Island, California, Navy Yard and commissioned May 24, 1944, this 329 ft. 6 in. by 73 ft. 4 in. by 45 ft. 8 in. combination hotel, hospital, power house and repair shop is a marvel of modern engineering and structural skills with 13 General Motors Diesel engines aggregating 15,380 hp. in two compact engine rooms. Of 9,250 tons standard displacement she takes on better than 6,000 tons of stores, supplies and equipment to meet the exigencies of a six or more months tour of duty and while not a ship of the line she carries a formidable array of defensive armament. To feed her near 16,000 horsepower she carries 1,110,766 gallons of fuel oil; 75,924 gallons of lube and 110,645 gallons of potable water. Six cold storage rooms hold refrigerated supplies for a complement of 1,016 enlisted men, 29 commissioned officers and 17 warrant officers, not to mention spare sub crews totalling 250 men—in fact, on one rendezvous at a small South Sea island the *Gilmore* furnished recreational facilities on the beach and fed close to 4,000 men from her galley and bake shop.

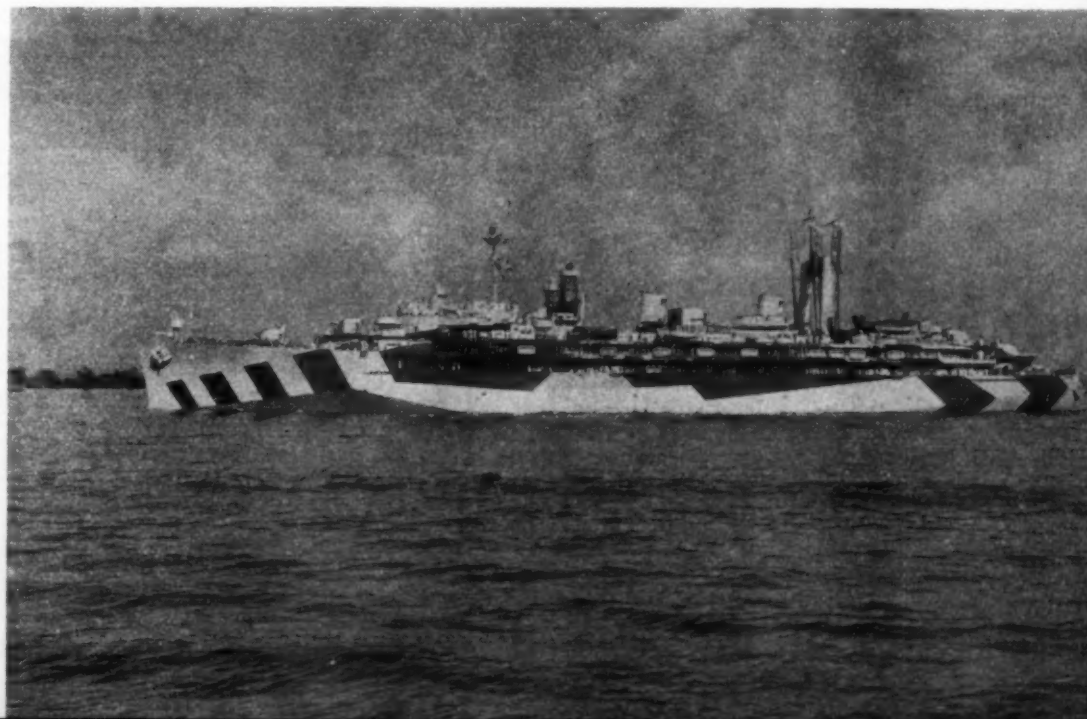
Three 5-ton York compressors with Diehl motor drives and a 900-lb.-per-day ice machine are installed for preservation of food under tropical conditions.

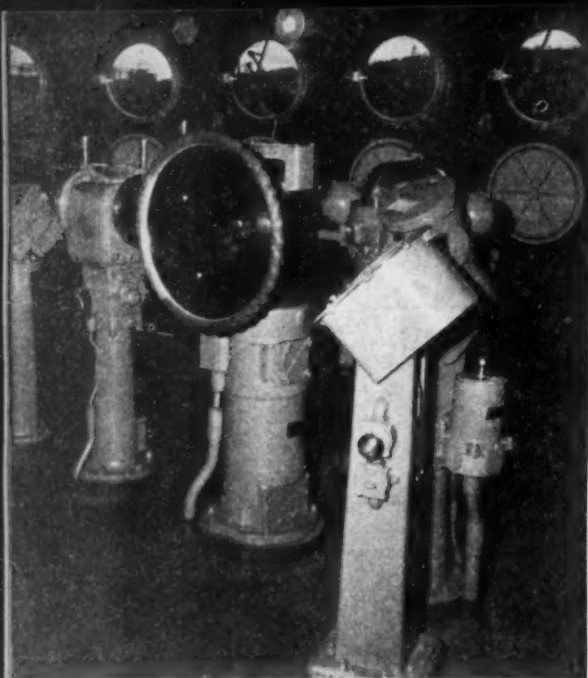
Keeping in mind the vital, as well as merciful purpose of this vessel every detail of its manifold services tempts us to dwell at length but



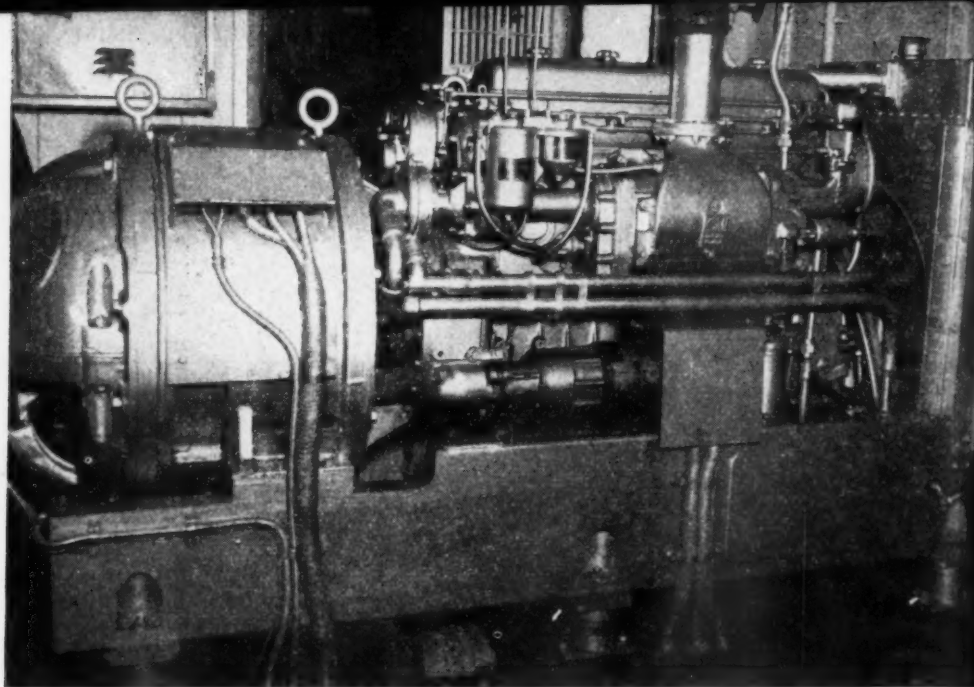
Schematic arrangement of the two engine rooms showing disposition of 12 General Motors Diesel generating units.

The sub-tender "Howard W. Gilmore" in war paint.

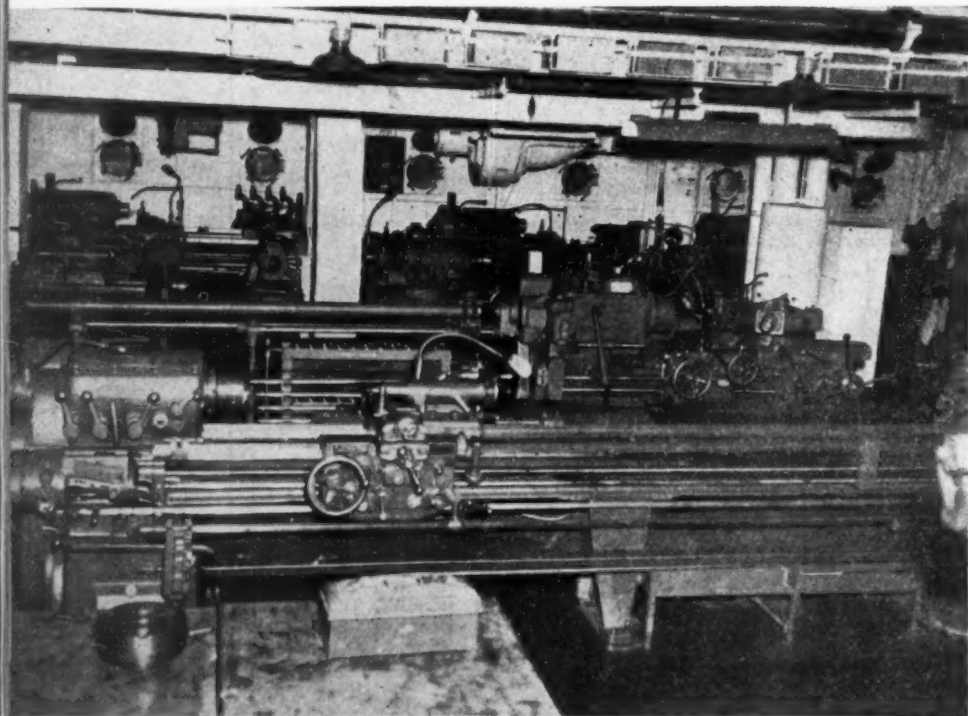




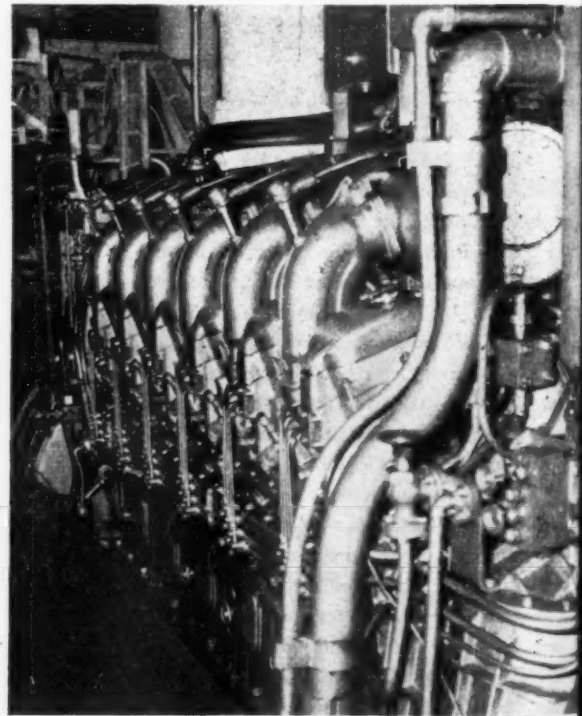
Navigating and control equipment in the pilot house.



The single General Motors 71-Series Diesel auxiliary lighting unit.

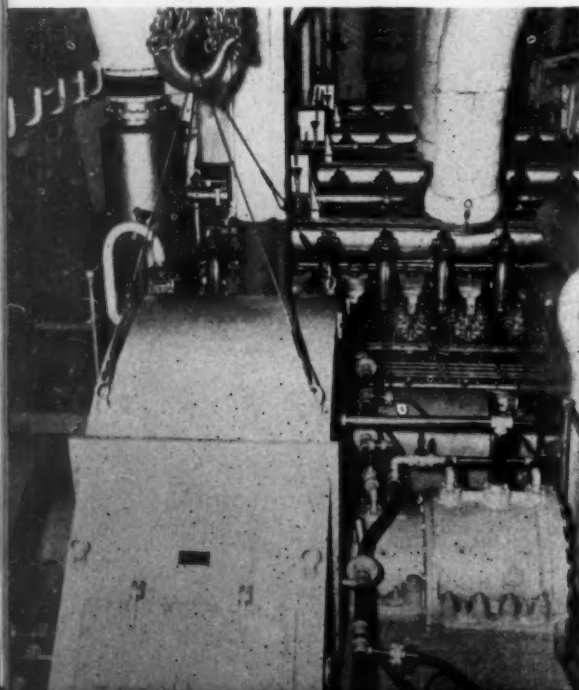


Partial view of the machine shop on the "Gilmore."

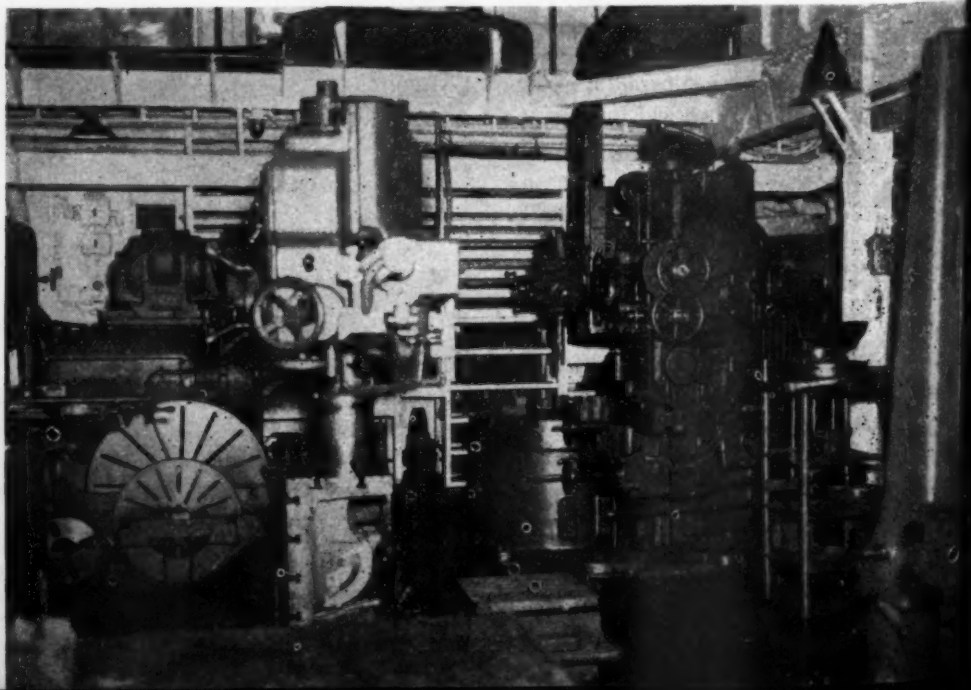


Close-up of one General Motors main Diesel.

Forward engine room showing Farrel-Birmingham starboard drive gear and three main Diesels



More of the machine shop is seen in this view.



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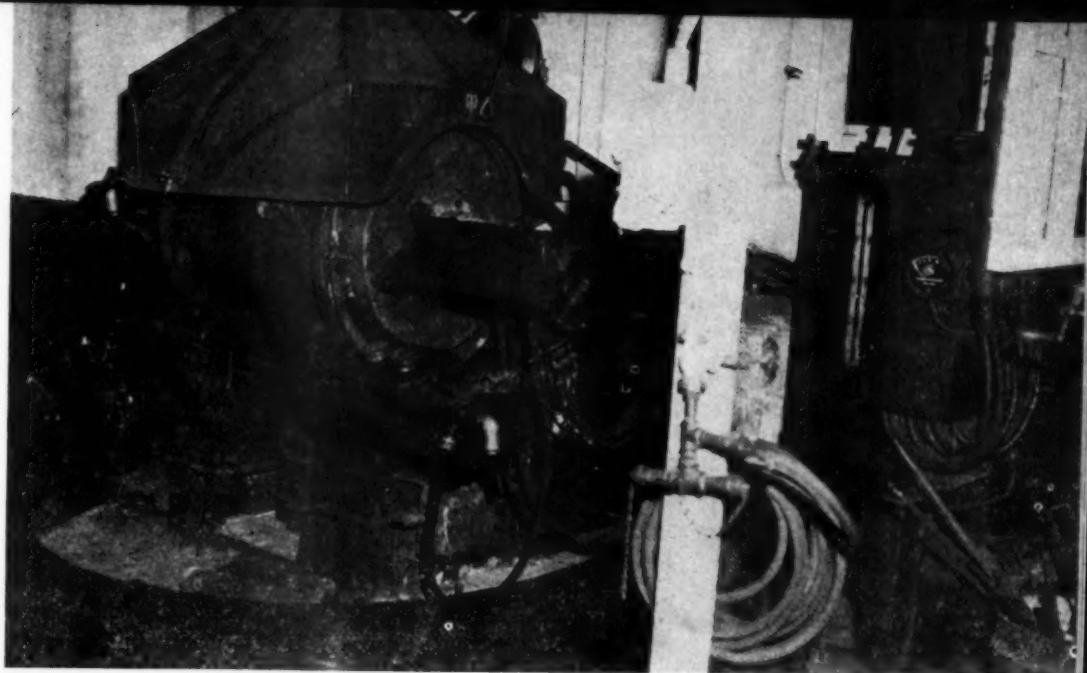
since all ship's services, even the lives of her brave men, rely on the prime power machinery let us go below and midships to the forward engine room. Here are four main 16-cylinder, V-type propulsion Diesels, of 1,600 bhp. each at 750 rpm. set parallel to each other and each driving a 1,125 kw. D.C. Allis-Chalmers generator. Flanking the main engines on the port side are two 12-cylinder, V-type, 710 hp., 720 rpm. Diesels driving Westinghouse 500 kw. A.C. auxiliary generators. Next inside the extreme starboard main generating unit is the starboard shaft drive (bear in mind this is a twin-screw ship—propellers are cast bronze, 4 bladed, 15 ft. x 15.92 in., mounted on 13¼ in. shafts) consisting of four Allis-Chalmers D.C. motors delivering 1,440 hp. each at 750 rpm. through a Farrel-Birmingham reduction gear. Add up the prime movers in this forward engine room and you have six General Motors Diesels—then visualize a similar layout in the aft engine room where the port drive machinery is located and you have 12 General Motors prime power Diesels with an aggregate of 15,290 hp., with eight Allis-Chalmers propulsion motors delivering 11,520 hp. to two propeller shafts through two Farrel-Birmingham reduction gears. Another Diesel, a General Motors 6-71 unit of 90 hp. at 1,200 rpm. with Westinghouse 80 kva. generator is fitted for emergency lighting. This brings the total Diesel hp. of this ship to 15,380.

The balance of the horsepower developed in the prime movers is required for ship's services including an extensive machine shop, blacksmith shop, a foundry capable of pouring 500-lb. castings, a forge shop, ship fitters and pipe shop, sheet metal shop, optical shop where submarine periscopes and various optical instruments are serviced, a torpedo shop, an instrument shop for servicing Diesel fuel injection equipment and various gauges, a printing shop and photographic shop. These are the most outstanding special services incorporated in this unusual vessel over and above normal ship's services—all of which require unusual amounts of electrical energy.

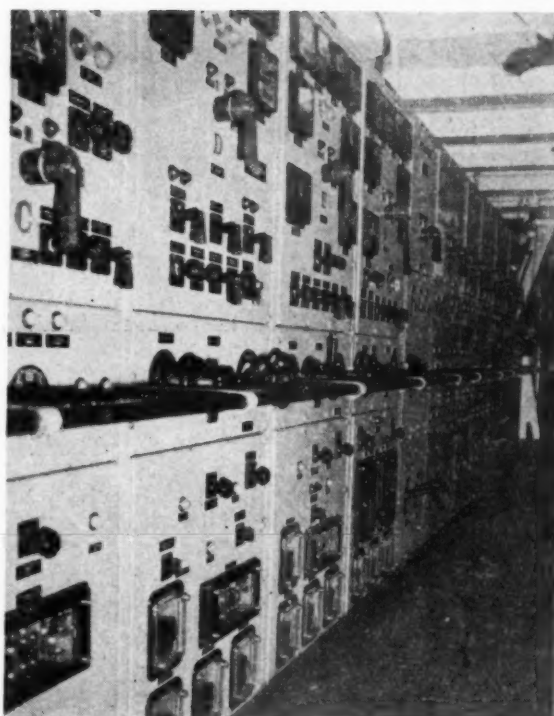
Between the two engine rooms there is the fire room where steam is generated in oil-fired boilers for ship's heating, cooking and laundry.

Two Foster Wheeler evaporators, of 20,000 gal. per day capacity each, recover fresh potable water from sea water for all requirements.

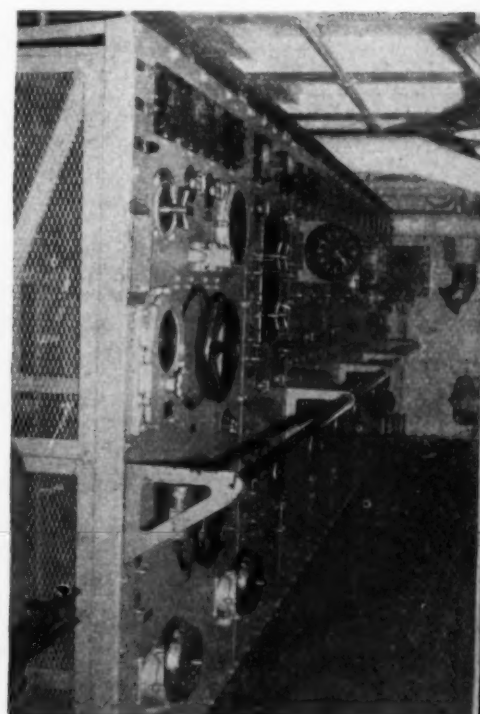
Returning to the engine rooms we find a great many more features all pointing to the Navy's meticulous care in providing for normal operating requirements as well as every foreseeable



One of two Kuhlman electric furnaces in the foundry.

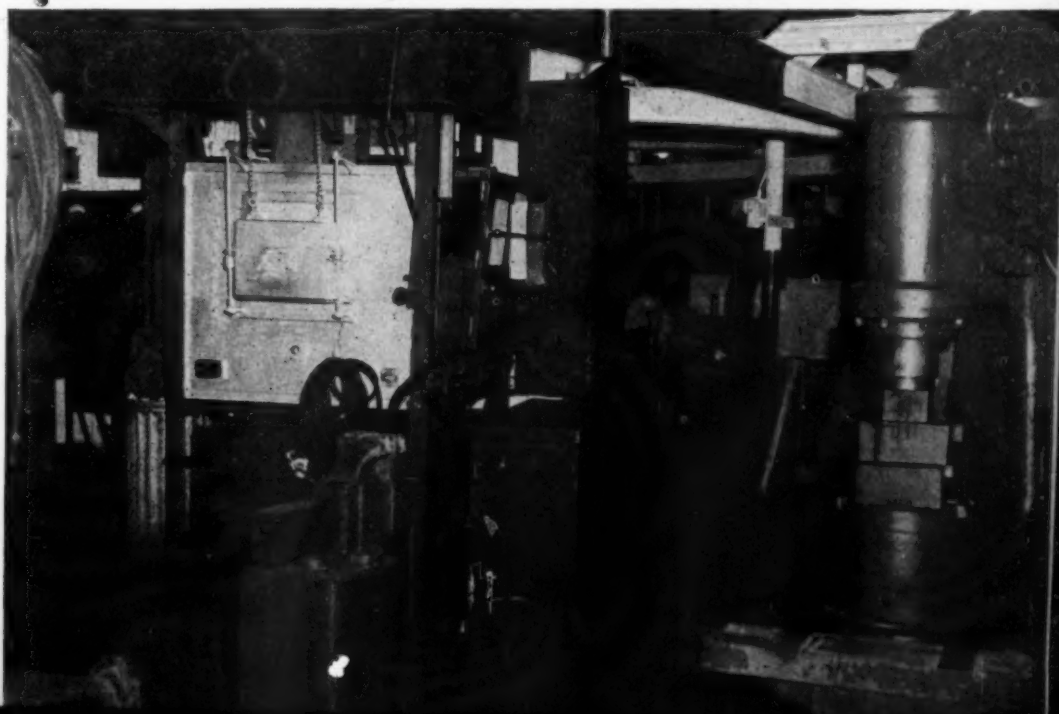


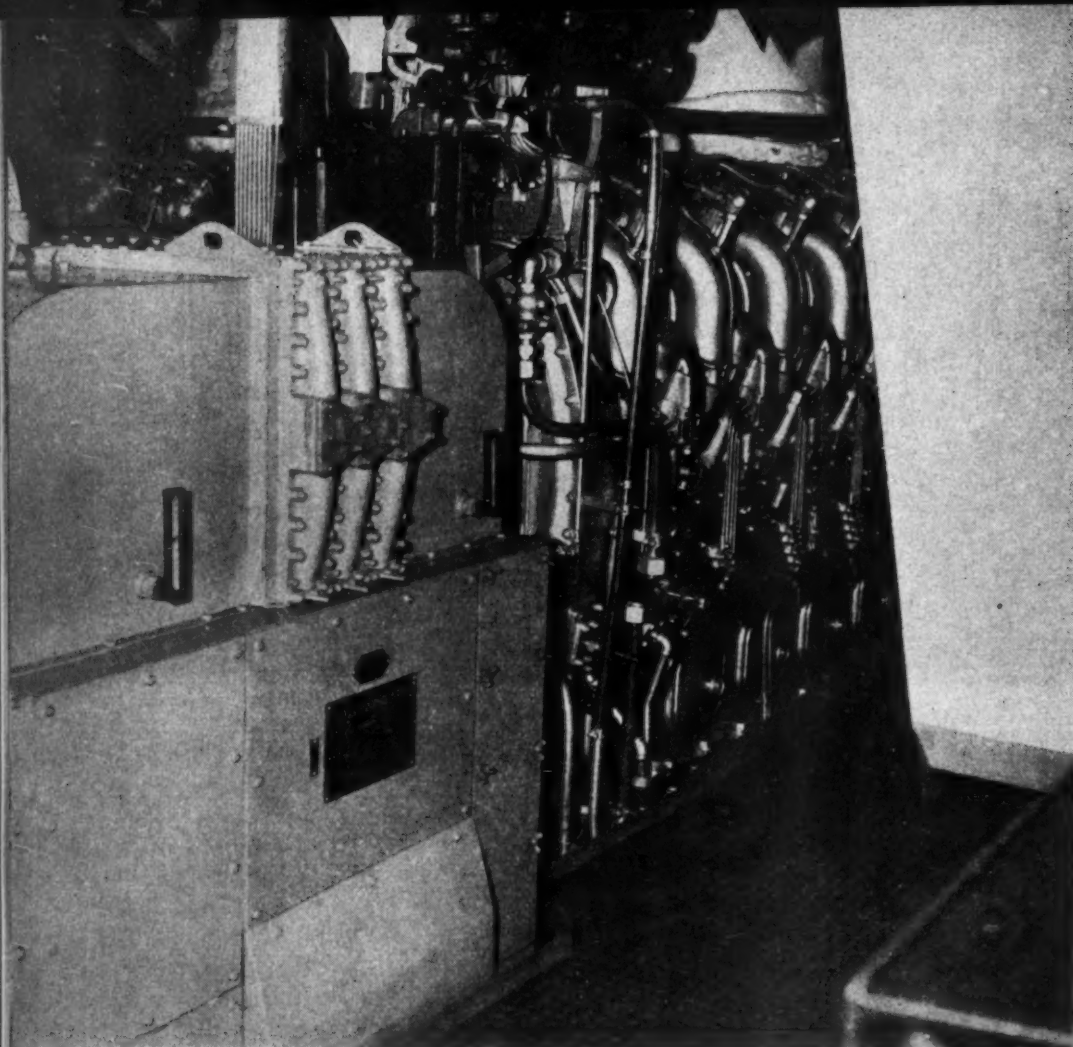
View of the electrical distribution board.



Six engines are controlled from this board.

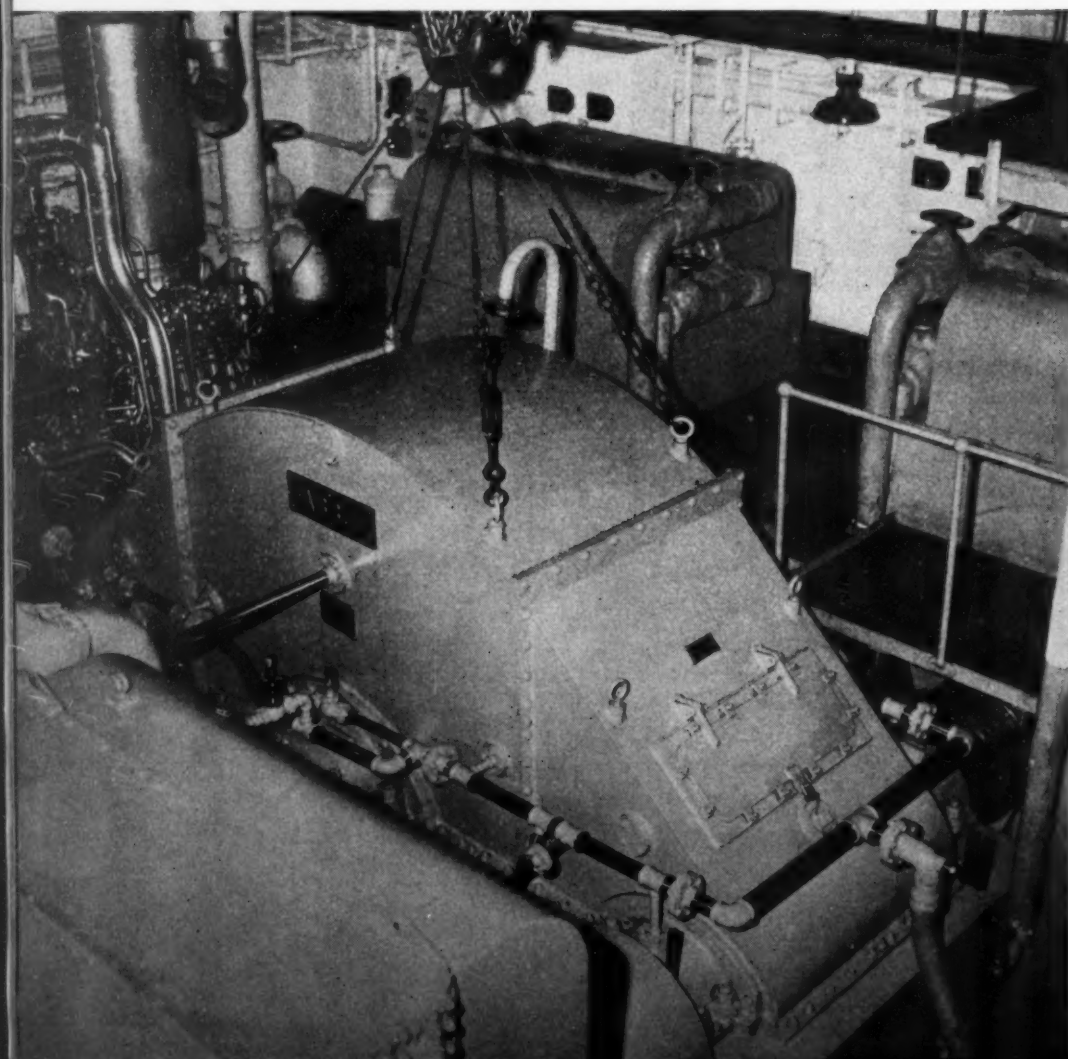
Heating furnace and power hammer in the forge shop.





Close-up of one Allis-Chalmers main generator and Diesel.

Seen here are one starboard main Diesel with Burgess intake snubber, upper left, and three of four Allis-Chalmers D.C. motors and Farrel-Birmingham gear on the starboard drive.



emergency. For example, all prime movers are set on Hussman spring mountings which not only absorb operational frequencies but are also designed to Navy specification for protection of machinery against the most severe shocks encountered in combat or attack. In each engine room there is a searchlight M-G set comprised of Electric Machinery 60 kw. synchronous motor and Star, 50 kw. generator.

Separate Allis-Chalmers M-G sets furnish excitation for the main and auxiliary generators, and another Allis-Chalmers 850 kw. M-G set is fitted for conversion of D.C. from two of the main generators to A.C. for ship's services.

Among engine room equipments, those most pertinent to the operation and continuous performance of the Diesels and drives are 4 De Laval centrifuges, 2 each for fuel and lube.

There are also Purolator fuel and lube filters on each engine; Harrison heat exchangers for lube and jacket water cooling are fitted on all engines and for cooling reduction gear lube; a Blackmer rotary pump circulates the reduction gear lube with Elliott twin strainers and Commercial Fulflo filters in the line; all engines are controlled by Marquette hydraulic governors. Burgess intake snubbers are fitted on each engine and exhausts are led through the uptake, with minimum expenditure of space, to the stacks where Maxim spark-arrester silencers are fitted. Engine control panels carry Weston combination lube and jacket water temperature indicators, American Ashcroft pressure gauges and Jones Motrola tachometers. An Electric Tarhometer revolution counter is fitted to each propeller shaft for recording total revolutions.

The compressed air required for starting so many Diesels is generated by Worthington, 2-stage compressors with Diehl motor drives—is stored in 12 bottles at 3,000 psi. and is reduced to 550 psi. for engine use.

It is hoped the foregoing together with accompanying illustrations may convey an overall picture of this all-important class of Naval craft as typified by the *H. W. Gilmore*. Outstanding in the maze of machinery, equipment, stores and services which are systematically packed into every corner of the vessel, is the comparatively small amount of space given over to the generation of 15,380 hp.—the extreme flexibility afforded through the use and interconnection of multiple Diesel generating units which are so disposed in separate machinery spaces as to assure adequate available power in any emergency short of total loss of the ship itself.

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DR. JOSEPH B. ENNIS-FIFTY YEARS WITH ALCO

Sees Bright Future For American Railroads

PREDICTING that new peacetime highs in passenger as well as freight traffic will be attained by American railroads in the next decade, Dr. Joseph B. Ennis, senior vice-president of the American Locomotive Company, rounded out fifty years with this organization by addressing 200 railroad executives, associates, and scientific leaders at a dinner in his honor on December 11, at the Waldorf-Astoria Hotel.

Dr. Ennis scoffed at pre-war critics of America's railroad system who claimed that duplication was a threat to railroad economy. "The war proved that our vast railroad system can be used 100 per cent capacity and," he said, "it became an 'adequate reserve' in solving the gigantic problem of shipping fantastic war tonnage great distances. This 'adequate reserve' is now to be applied to our peacetime reconversion. Its war record has revitalized the railroads of America, and they are ready, willing, and able to assume the responsibility of carrying ever-increasing loads of freight and passengers."

Contributions to railroad engineering science by Dr. Ennis are known throughout the world. Locomotives designed by him include the Mallet, Pacific, Hudson, and Yellowstone, and his creations operate in France, England, Germany, China, Spain, Portugal, India, and Latin America. Early last year he was awarded the George Henderson Medal by the Franklin Institute. He is a member of the institute's Committee on the Science and the Arts. He is also a fellow of the American Society of Mechanical Engineers, a member of the American Society for Steel Treating and is American Member of Council, the Newcomen Society of England.

Pointing to a new evaluation of travel, Dr. Ennis praised the youth of America for its geographic knowledge of London, Cairo, and Shanghai in the same terms that his generation regarded nearby towns. "Travel is no longer a luxury item," he said. "People who never traveled more than fifty miles before are now prospects for commodious, fast, safe, and economical travel. Railroads are working to this end right now. In this unbounded era of travel-consciousness, all American transport systems will share in accordance with expedience and personal preferences of the traveler.

"The demand for travel will be so enormous



Dr. Joseph B. Ennis, Senior Vice President, American Locomotive Company.

that all forms of transportation are rightfully girding themselves to handle peak loads, not just to divide up present travel volume," he said.

In a dramatic review of his own fifty years in the science of locomotive engineering, Dr. Ennis told his audience that the opportunities for young men in railroading are greater today than they were when he entered the industry as an apprentice draftsman at Paterson, New Jersey, in 1895.

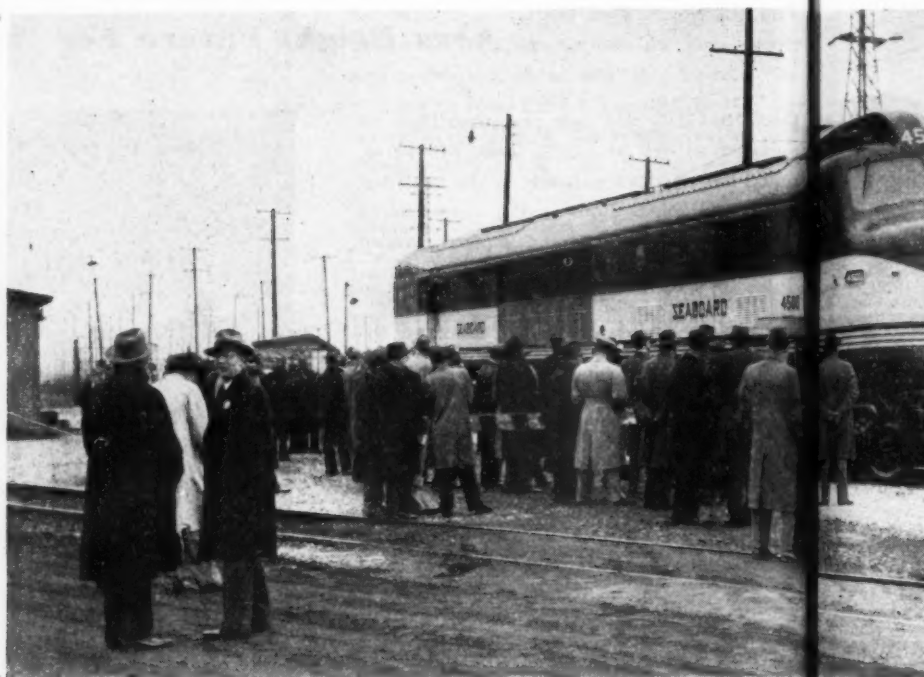
Dr. Ennis predicted a new and greater place for Diesels in locomotion. He also predicted eventual harnessing of atomic power and appli-

cation of this new energy and others yet undiscovered for railroading as well as other power-motivated industries.

The dinner meeting was presided over by Dr. William C. Dickerman, chairman of the board of the American Locomotive Company. Other speakers included Dr. Charles J. Hardy, a director of Alco; Samuel G. Allen, chairman of the board of Lima Locomotive Works; Paul Kiefer, chief engineering of motive power and railway supply for New York Central; Dr. Charles Penrose, senior vice-president for North America, the Newcomen Society; and D. W. Fraser, president of the American Locomotive Company.



SEABOARD RAILROAD GET



Left: Miss Catherine Coleman, registered nurse on Seaboard's Silver Meteor christens (with orange juice) the new 3000 hp. Diesel locomotive.

Guests were to



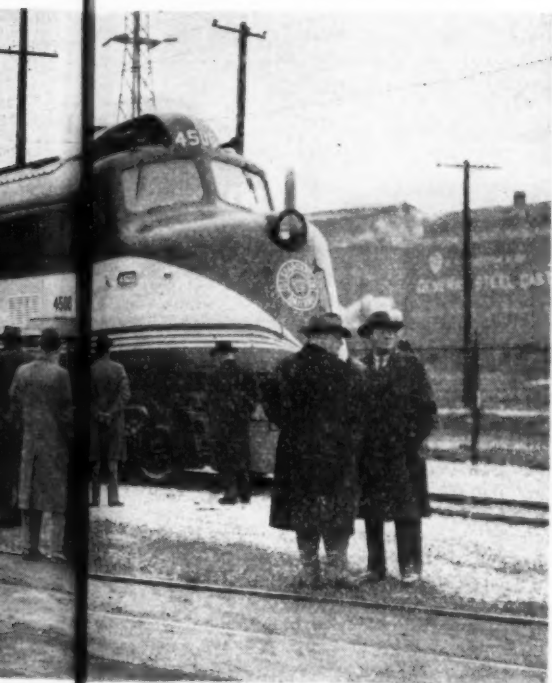
Principals at the christening, left to right: L. W. Metzger, Div. V. P., Locomotive and Southwark Div.'s (BLW); C. E. Brindley, Chairman of the Board (BLW); L. R. Powell, Jr., Receiver, Seaboard Ry.; Miss Catherine Coleman, Seaboard Registered Nurse; Ralph Kelly, Baldwin President.

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ADGETS MOST POWERFUL SINGLE UNIT

DIESEL LOCOMOTIVE

By CHARLES F. A. MANN



Silver
motive.

Guests were taken for short rides over Baldwin's test track.



L. R. Powell, Jr., Receiver, Seaboard Railway, on speaker's stand, addressing his remarks on acceptance of the locomotive to Ralph Kelly, President, B.L.W., left foreground, and guests.

AT an impressive ceremony held in Philadelphia, December 3, officers of the Seaboard Air Line Railway took delivery of the world's most powerful single-unit Diesel locomotive, a 3,000 hp. twin-turbocharged Diesel combination freight and heavy passenger unit, built by Baldwin Locomotive Works.

For six years the railroad industry has talked and argued about the relative merits of the multiple-unit vs. single-unit Diesel locomotive. But nothing has happened till now. Engineering groups in the various locomotive companies and mechanical officers of many systems have dreamed and made wash drawings—beautiful to look at—of everything from 2,500 to 10,000 horsepower, all crammed into single giant cabs up to 110 feet long. The nearest thing to a reality in this direction, was a scheme for a 6,000 hp. single unit Diesel, by Baldwin.

From this has finally evolved the first large-power single unit Diesel from Baldwin's vast Eddystone plant, locomotive hatchery for a startling array of motive power, including enough classy new steamers to re-power the French railways; the giant steam turbo-electric masterpiece forthcoming for the Chesapeake & Ohio, and now the brilliant new Baldwin Diesel road locomotive for the Seaboard. The Diesel locomotive industry must at least give Baldwin credit for adopting a wide-open policy on motive power, whatever it is, instead of conniving quietly with the bituminous coal crowd to strangle Diesel wherever possible. And it must be recorded in passing, to keep the record straight, that the 1944 Presidential Report of the C & O, wherein Diesel was squashed flat, has obviously had no effect on the sound engineering done by Baldwin in the production of this new Diesel-electric machine for the Seaboard Railway.

The new Seaboard Diesel has three rather distinct contributions to the Diesel locomotive sum total. Two of them are obviously sound advances in design that may set up considerable controversy around the country.

1. The weight on all axles is low by comparison with the majority of existing Diesel locomotives. The driving axles carry a weight of approximately 51,000 lbs. and pilot truck axles approximately 42,500 lbs.

2. By means of an ingenious "double bottom" construction of the cab floor framing, all boiler water, cooling water and lube oil is carried inside a welded-steel, flat box, the top of which is actually the entire floor of the cab—exactly like a modern steamship.

3. The entire load from either end is carried directly from the drawbars through the two articulated trucks, instead of through the cab, which is a unique departure in Diesel locomotive design and follows the general practice in electric locomotive design. The cab merely sits on the running gear as a Diesel powerhouse and tank space and carries no part of the load.

The Diesel power plant consists of two Baldwin vertical 4 cycle, 12¾ in. bore x 15½ in. stroke engines, equipped with Elliott Buchi turbochargers, which deliver their rated power at 625 rpm. This design features drilled crankshaft, Satco precision type shell bearings, chrome plated cylinder liners and heat treated aluminum alloy oil cooled pistons, with 5 compression rings and 3 oil rings. American-Bosch fuel injection system is provided, with motor driven transfer pump from storage tanks.

The electric system centers around a 100% Westinghouse design, with 750 volt, 1760 amp. (max.) self ventilating, separately excited roller bearing mounted generator, direct connected to each Diesel. A 75 volt auxiliary generator for battery charging and a variable voltage exciter are mounted on the main generator shaft extension, via V-belt drive. Both are of 7½ kw. output. The four traction motors on each power truck are series wound, forced ventilated through an air duct system built into the "double bottom," fed down through slots in the truck framing, and are geared 25:54 for a maximum speed of 85 mph. Two 40 hp. traction motor blowers are provided for cooling. Power

GENERAL CHARACTERISTICS

Specification No. DE-R-30-2

Type: 4-8-8-4

<u>Gauge</u>	4'-8-1/2"
<u>Diesel Engine</u>	Two 8 Cylinders in line..... 1500 bhp each Supercharger
<u>Driving Motors</u>	Number
	Maximum Safe Speed
	Gear Ratio
	Type
<u>Journal Bearings</u>	Type
	Size
<u>Wheels</u>	Driving
	Idling
	Diameter
<u>Wheel Base</u>	Truck (Driving)
	Total Locomotive
<u>Running Gear</u>	Articulated Trucks
	Swivel Trucks
<u>Underframe Construction</u>	Structural
<u>Total Weight</u>	In Working Order
	Light
	On Drivers
<u>Maximum Overall Locomotive Dimensions</u>	
	Width
	Height
	Length (Inside Knuckles) ...
<u>Starting Tractive Effort</u>	At 30 percent Adhesion
<u>Continuous Rating at 20.5 M.P.H.</u>	45,300 Lbs.
<u>Minimum Radius Curvature</u>	
<u>Supplies (Total Capacity)</u>	Locomotive with Train
	Lubrication Oil
	Fuel Oil
	Engine Cooling Water
	Heating Boiler Water
	Sand
<u>Air Brake Schedule</u>	24-RL Westinghouse

TONNAGE RATINGS

BALDWIN-WESTINGHOUSE

3000 H.P. DIESEL LOCOMOTIVE - TYPE 4-8-8-4

BASED ON: Sea Level
40" Wheels
Tangent Track
Grades Compensated for Curvature
50 Ton Cars
25:54 Gear Ratio

PER CENT GRADE	20.5 MPH	30 MPH	40 MPH	50 MPH	60 MPH
Level	6500	4325	2740	1915	1340
.2	4460	2610	1710	1210	840
.4	3060	1825	1195	850	590
.6	2290	1370	890	625	440
.8	1810	1080	690	475	340
1.0	1475	875	547	366	260
1.2	1235	720	440	285	205
1.4	1060	605	357	220	155
1.6	910	511	291	169	125
1.8	793	435	234	127	95
2.0	695	372	192	92	65
2.2	615	320	148	62	45

for starting and operation of controls is provided from a 32 cell 64 volt Philco storage battery system mounted in the center radiator compartment. Electropneumatic traction motor controls are fitted, with automatic transition. Wheel slip control is also fitted. A large-capacity, 2,250 lb. vapor car heating boiler is mounted directly back of the operating cab, with handy dashboard controls for the fireman.

Three air reservoirs, fed by a Westinghouse air brake compressor mounted on each Diesel, are fitted, with a total of 57,000 cubic inches capacity. Four axial flow cooling fans, each 42 inches

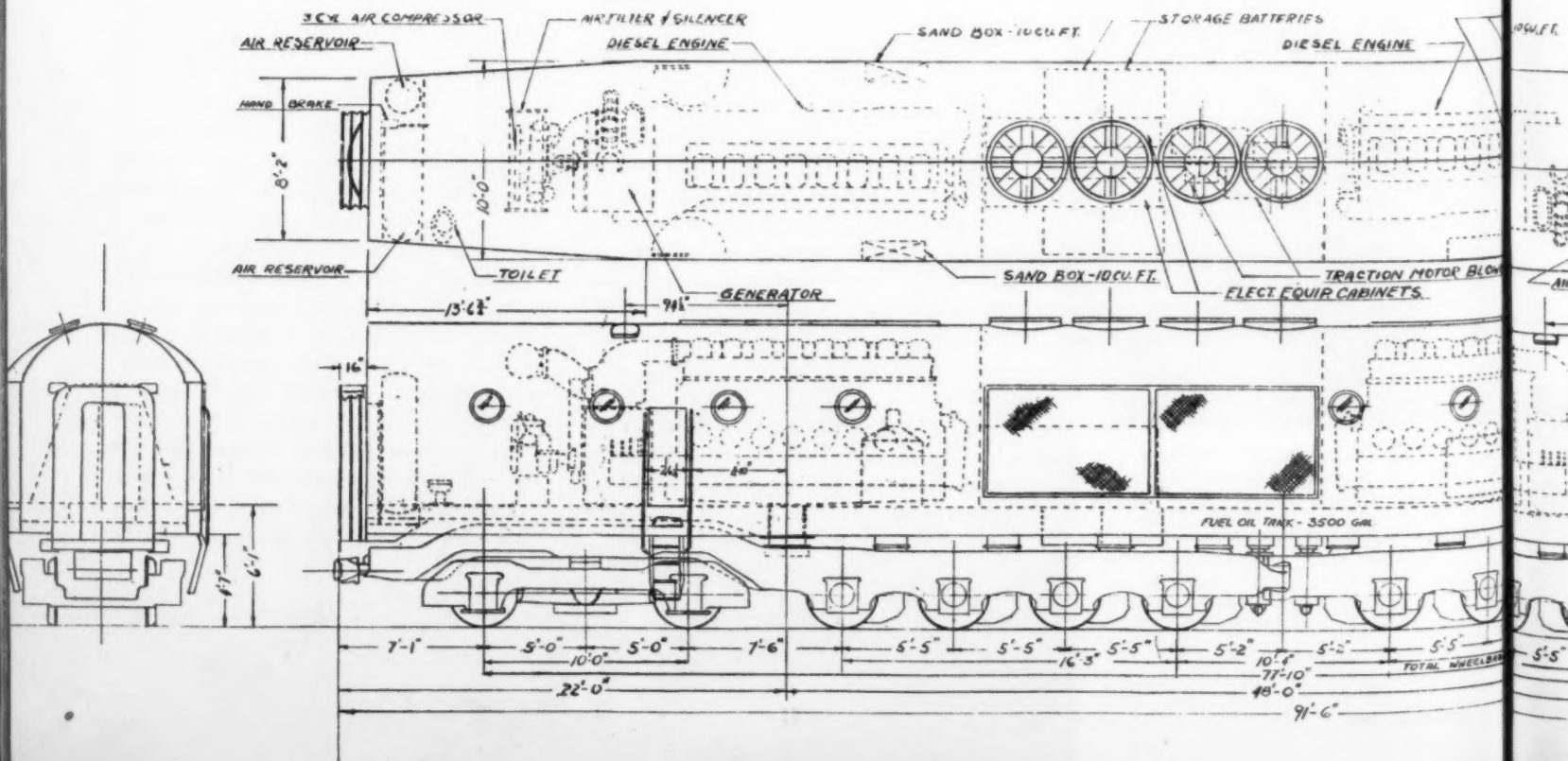
in diameter and driven by 37 hp. motors are fitted, drawing air in through the side-mounted radiators and out the roof, which, by a complete thermostatic control system, automatically keep the Diesels at proper temperature without manual attention.

The two articulated trucks carry the drawbar load to the swivel joint at the center of the locomotive, and the 4-wheel pilot trucks spread the load and improve riding qualities at high speed, on curves and rough track. All wheels are 40 inch diameter. This locomotive is a single-ender, and there is absolutely nothing

missing in this Baldwin design!

Seaboard Railroad is stepping out, not after the reconversion period, but RIGHT NOW! They have already entered the fast freight race on 3rd morning delivery of perishable freight from Florida to New York, in conjunction with the Richmond, Fredericksburg & Potomac and the Pennsylvania, which give through fast connections north of Richmond.

These kindly friendly, Virginians believe their 4,168 mile Atlantic Seaboard railroad, essentially a high-speed single track system, with a





View of the new single-unit, 3000 hp. Baldwin Diesel road locomotive immediately after christening and acceptance by Seaboard Railway.

long, low-grade freight line Second Main Track via Charleston, S. C., is destined to do big things in rail transportation after the war.

Their Diesel-hauled "Silver Meteors" have produced operating and operating profit records almost unparalleled in railroad annals. The Seaboard is just as interested in fast freight as it is fast passenger service, postwar, and vice-versa—it is not an all-freight or all-passenger line, but has a terrific stake in both.

We cite these points to give depth to the background behind the purchase of this Baldwin, single-unit Diesel, for the 3,000 hp. size is

almost optimum for the Seaboard, and the axle-loading is light enough to ease the worries of the engineering department who want fast operation at high speed, but do not want to have to spend fifty or sixty million dollars relaying steel to make way for high-axle loading Diesels. Thus Seaboard has a vital interest far beyond the mere fact that it has bought Number One of a new type of Diesel locomotive.

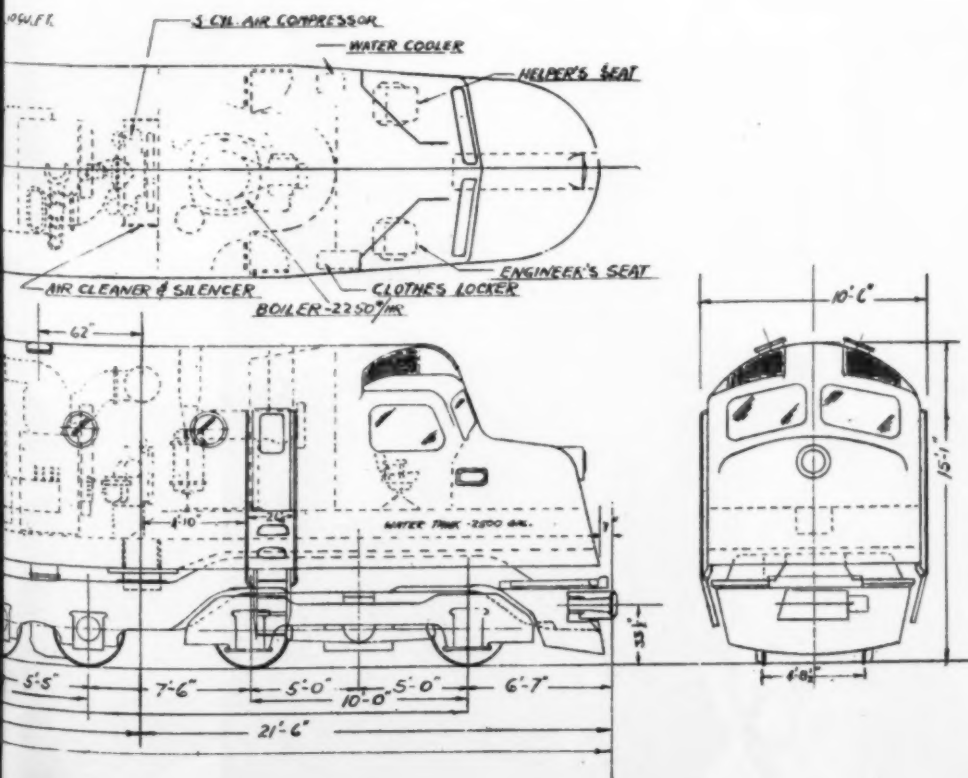
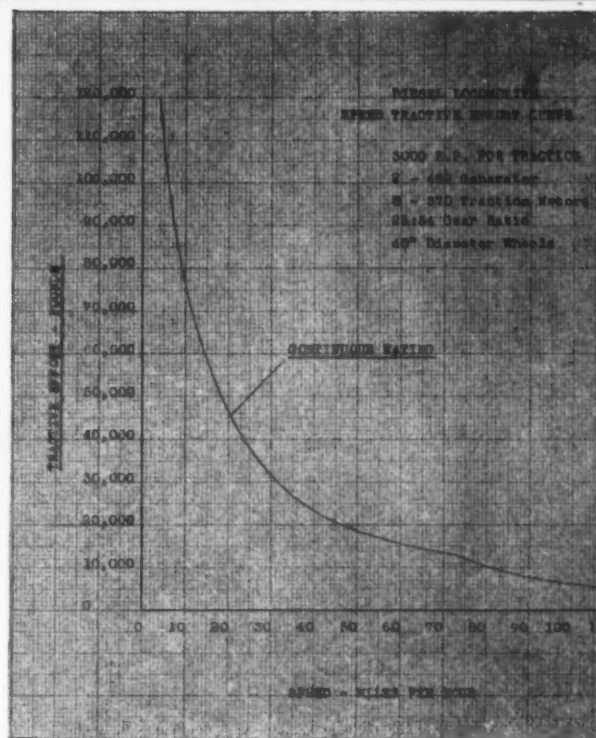
Thus when Baldwin not only creates an 85-mile-an-hour freight Diesel, it actually offers a model originally designed to ride safely at 120 miles per hour, with higher gear ratio, and a unit that can easily be taken off fast freight and put

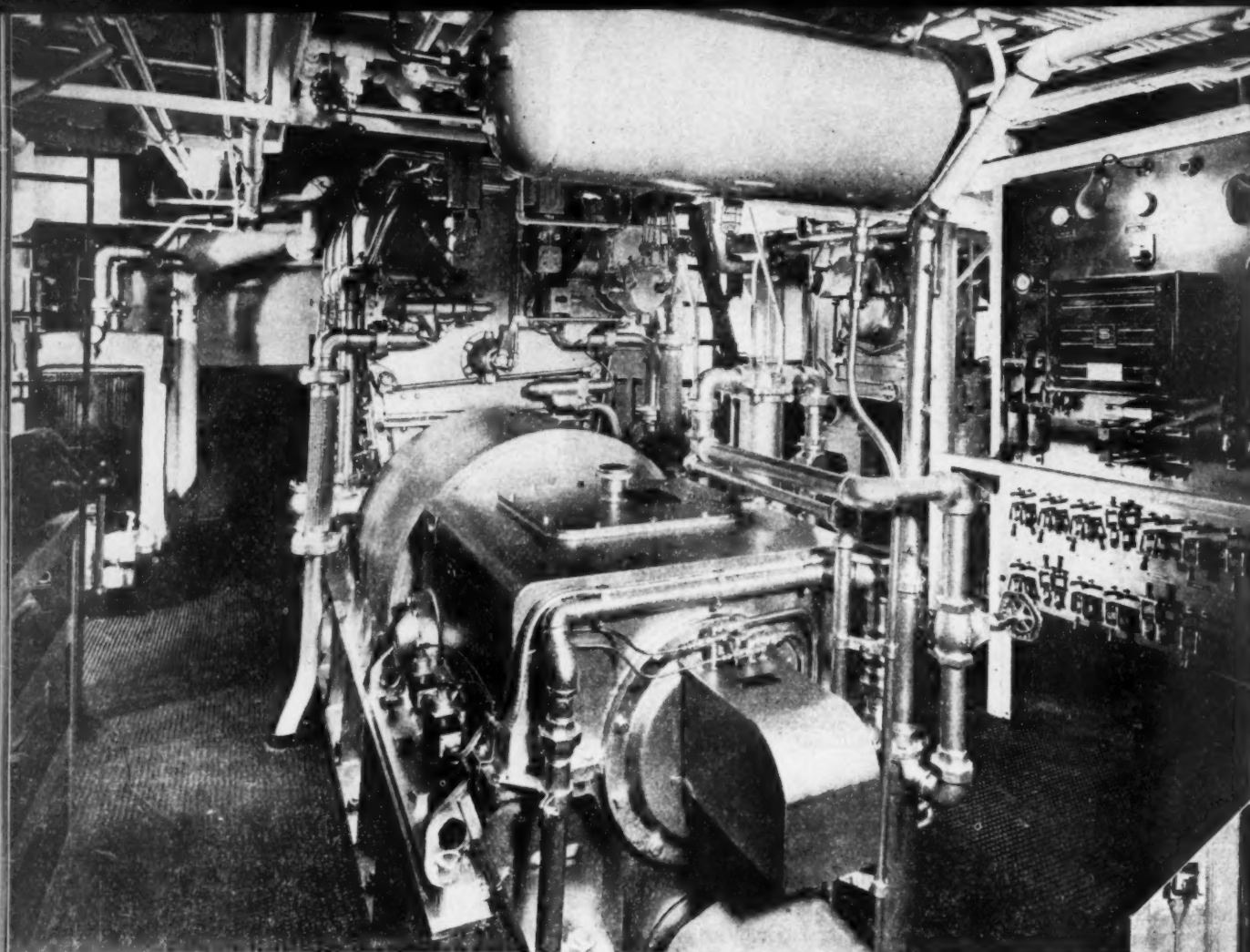
on fast passenger with not one change necessary except to couple it on. Three thousand horsepower will yank a 50-car produce special from Florida at 60 miles per hour. This 3,000 horsepower size will pull a 16-car lightweight Silver Meteor at scheduled speed, as well as that 50-car produce special, as the accompanying ratings will show.

Almost before the 6,000 ton freight train pulled by a large size Diesel has had a chance to prove its economic soundness, the Seaboard Railway has proved that its future as a transportation mechanism, rests on 2,500-3,000 ton freights at passenger train speeds. It is well ahead into the region of the long-planned one-speed-railroad, whereon everything will move at a fast, even pace, and playing leapfrog with passenger and freight trains is an outmoded philosophy of operation.

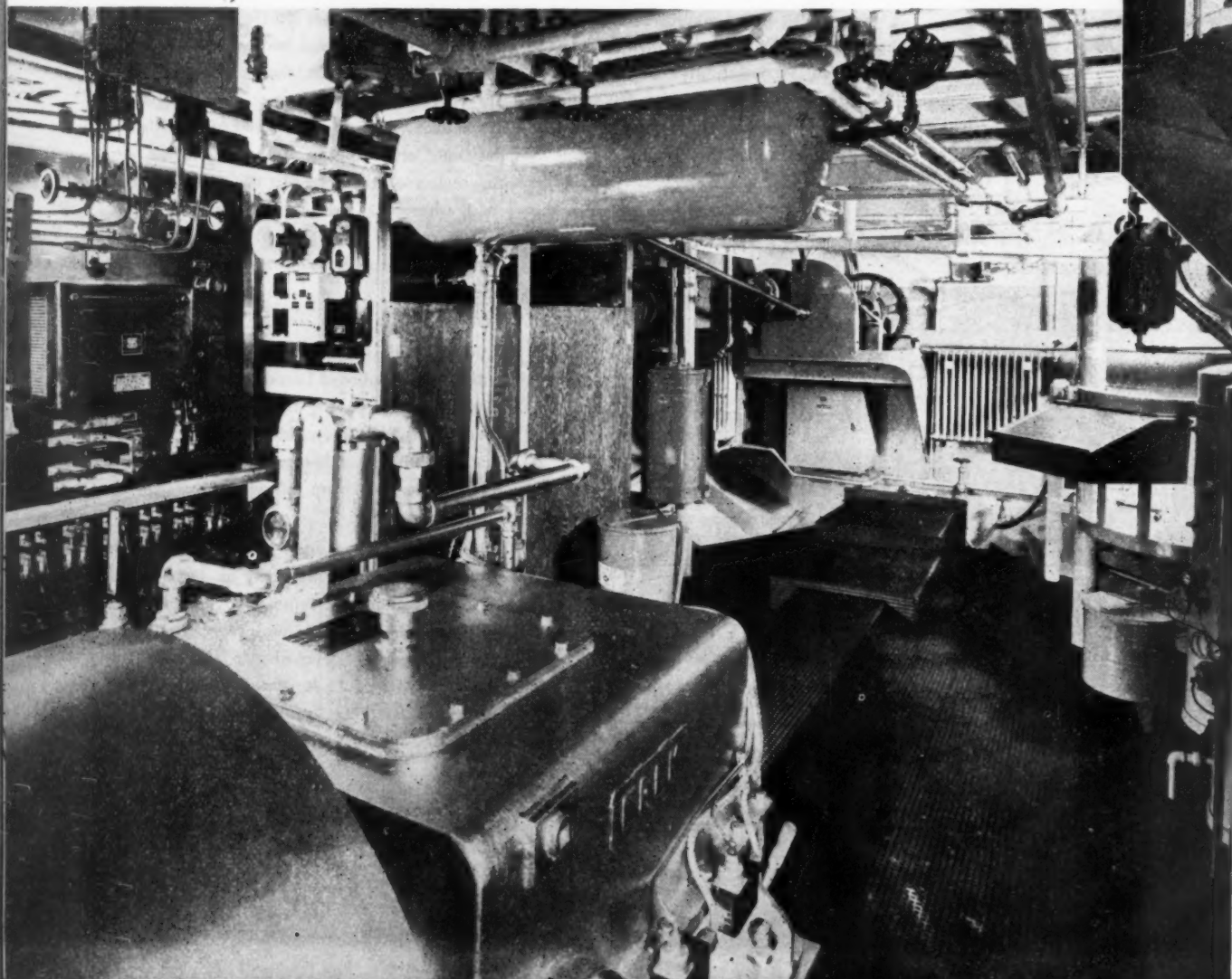
Thus L. A. Porter, the Diesel boss of Seaboard, will take his Seaboard Locomotive Number SAL 4500 and start paving the way for more railroad "firsts." The records made by this new machine will be of increasing national interest as it begins to pile up mileage.

The long talked-of single-unit Diesel locomotive became, at last, a reality on December 3, 1945, and one more important chapter in the brilliant administration and reorganization of the picturesque Seaboard Air Line Railway, made by Messrs. L. R. Powell and Henry W. Anderson, has been "put in the book."





Engine room view looking forward over the Falk marine gear and clutch to aft end of General Motors, 800 hp. main Diesel. Looking aft in the "Turecamo Boys" engine room. Exterior view of the tug "Turecamo Boys" is featured on the front cover of this issue.



Upper engine room grating.

ANOTHER "TURECAMO BOYS" DIESEL TUG

By WILL H. FULLERTON

NOT as large as the *Turecamo Boys* tug described in DIESEL PROGRESS July 1936 but more powerful, the new *Turecamo Boys* recently joined the famous B. Turecamo Contracting Company's fleet. First new postwar tug to be seen in New York harbor, she is 80 ft. 4½ in. long overall, 21 ft. moulded breadth, and 10 ft. 2½ in. in depth. This rather moderately sized tug packs more than ordinary power with her 800 bhp., 8 cylinder, 2-cycle General Motors marine Diesel operating at 750 rpm. through a Falk reverse and reduction gear turning the propeller shaft at 250 rpm. With full pilot house control she shows excellent maneuverability—developing 11.46 knots at top engine speed, 10.8 knots at 650 rpm. on the engine and negotiating a crash stop in 28 seconds. Winton Diesels powered earlier units of the Turecamo fleet as well as the company's own generating plant and since these famous engines have served them so well it is natural that Barney Turecamo should continue with Winton's successors.

Turecamo Boys was designed by Merritt Demerest and built by Jakobson Shipbuilding Company. Construction is all-welded steel with crew's quarters for six in the foc'sle, cook's and engineer's room on the main deck and Captain's room abaft the pilot house. Of 113 gross tons she carries 12,300 gallons of fuel—a job worthy of the traditions of her owners, and builders. Turecamo Company has shown its Diesel-mindedness down through the years, having used Diesels in a variety of equipment including marine, stationary and mobile units.

Starboard side of main Diesel, right, and Reiner auxiliary unit with Hercules Diesel, extreme left.

Wheelhouse with engine control stand, lower right.

Galley and mess.

Engineer's and cook's quarters.



LEAVE US FACE IT

The Smoky Old Steam Locomotive Fades Out With 1945 As Diesel Hits Its Stride in 1946

By CHARLES F. A. MANN

Editor's Note: Our Mr. Mann popped into the office just before the Holidays, midway on another of his almost fantastic transcontinental railroad trips, digging into the complex Diesel railroad picture, as usual. We asked: "Well, how does it look" . . . He replied: "Well Steam is a Dying Duck!" . . .

FOR ten years the railroad industry, the bituminous coal industry, the financial mechanism of the nation, particularly that portion of it centered in New York, and the Old Guard in U. S. business has spoken of the great strides in Diesel locomotive development with tongue in cheek.

Ever since the Pioneer Zephyr on the Burlington proved that Diesel motive power was a sound economic proposition, Diesel propulsion on railroads has been a hotly controversial topic. "Special Situations, yes" . . . "Fine for light-weight streamliners, but heavy steam can out-perform Diesel on freight any day" . . . "Steam locomotives can be improved to skin Diesel on any job, just wait and see" . . . "Diesel freight power—pooh!—give us Old Reliable coal burning steamers or the new A.C. Electrics, and we'll run Diesel out of the picture" . . . Ad infinitum.

But the war came along and from the very first big Diesel freighter, No. 100, built by General Motors as a test model, which at this very moment is rounding out a million miles or more in segments on the Southern Railroad; and No. 2, the first big Diesel freighter to go into service on a regular schedule, on the Santa Fe, the performance has been so terrific that the whole locomotive industry of not only America, but the world, has been in a numb sort of daze. Figures don't lie. The 300 lb. boiler pressure, simple articulated model that was supposed to put the skids under Diesel in 1944-1945, has proved to be a nifty steamer, but about 35% behind Diesel performance.

Meanwhile Diesel goes ahead on an amazing scale. For the 3rd consecutive year now, not a steam switcher has been ordered. By 1950 or 1955 the yard goats, whose noise, dirt and perfume has been as much a part of the American transportation scene as mince pie or clam chowder, will be extinct as a Dodo and will end up peacefully in Pittsburgh's blast furnaces as No. 1 melting scrap. A recent tabulation gives the present 1946 Diesel switcher order file at 119 switchers, vs. zero steam switchers. All railroads report savings up to 300% when they

substitute Diesel for steam switchers.

The road engine picture for 1946 is more beautiful than current data show, for half the 1945 orders for big Diesel passenger and freight power have not been delivered, and this, added to nearly 150 Diesel locomotives ordered for 1946, adds up to four times as many road Diesels as there are road steamers in prospect for the first full postwar year. Another thing, practically all the 75 big steamers that show up as 1946 orders, are mostly slop-over orders for 1945! Y'can't always believe these "feudin' statistics" from the locomotive people!

To President Martin W. Clement of the Pennsylvania Railroad goes the motive power thrill of 1945. Pennsy has been the fulcrum in the whole future of Diesel for the past six years. From Philadelphia headquarters of the world's greatest railroad hierarchy has come repeated, at times, ominous thunder to the general effect that its research department was pulling newer and vaster steam rabbits out of its vast fedora. Geared side-rod turbines; stiff-framed double engines that could negotiate $2\frac{1}{2}$ degree curves at 140 miles per hour, safely, and run from Crestline to Harrisburg without stopping for

lube oil; and bigger and better designed. The city of the waited for Pennsy—the world constantly from his that the Century, night after though Penn, finally ordered Diesels for 3,000, 4,500 combinations Harrisburg.

Thus at carrier; the goes Diesel that this "A" units units with combination.

New York due to which more electric of its Har also train far it open Centuries, Chicago, a bocker, No. likes Diesel fabulous 100% dea aristocratic it! Our g York Cent don further Harmon.

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tube oil; turbines with direct gearing to wheels and bigger and better 4-8-4's—the Old Reliable and best type of American steamer ever designed. But always the waiting railroad fraternity of the U. S. held its breath and respectfully waited for that final pronouncement from Pennsy—the great god of steam power of all the world. President Clement, after perusing a constantly piling-up file of performance reports from his operating department to the effect that the 4,000 hp. "Test Diesel" on the NYC's Century, ran away from the Pennsy's Broadway, night after night, just out of Chicago, even though Pennsy had 2 steamers hooked in tandem, finally yielded, swept away all doubts and ordered ten 6,000 hp. 4-unit, dual purpose Diesels from General Motors, to be run as 3,000, 4,500 and 6,000 heavy passenger combinations on every crack Pennsy passenger from Harrisburg to Chicago and St. Louis.

Thus at one swoop, the world's greatest coal carrier; the world's greatest electrified railroad, goes Diesel in the grand manner. Keep in mind that this represents forty 1,500 hp. units, half "A" units with operating cabs, and half "B" units with heating boilers, to give a flexible combination of power for all needs.

New York Central gives a well-hidden, but vital clue to what it plans for the future of Diesel vs. more electrification, by the very size and layout of its Harmon Diesel shop, now being used to also train more Central Diesel personnel. So far it operates six 4,000 hp. GM Diesels on the Centuries, Nos. 25 and 26, from Harmon to Chicago, and on the Southwestern and Knickerbocker, Nos. 11 and 12 and 41 and 24. Central likes Diesels. It now seems assured that the fabulous electrification program to Buffalo is a 100% dead duck, although everybody in that aristocratic, fine old railroad refuses to admit it! Our guess is that by summer of 1946, New York Central will go Diesel and formally abandon further dreams for electrification beyond Harmon.

In fact only the Pennsy and NYC, of all U. S. Systems, have traffic density and extraneous benefits enough to even waste fifteen cents in further contemplation of electrification regardless of the future outlook for coal prices.

Our readers should keep in mind that from 15,000 to 20,000 passenger cars will be needed to re-equip U. S. railroads. About 1,000 have now been ordered. Over seven hundred of those already ordered are to be hauled with Diesel locomotives!

By next summer the Far West will see three

great Systems racing Westward with fantastically new and modern lightweight Diesel trains on 40-46 hour schedules from Chicago. Five Diesel Empire Builders over the Burlington-Great Northern to Puget Sound will probably be first. Close on its heels will be a Puget Sound Hiawatha, Diesel propelled, that the Milwaukee is secretly cooking up in its vast Milwaukee, Wisc., car-shops. Smart folks, the Milwaukee. They build, design and equip their own passenger cars! The Burlington-Rio Grand-Western Pacific trio will have five or six "California Zephyrs" on fast, Diesel schedule. Rio Grande already has its own Diesels for its part of the run, ready to go. Fourth in the Western picture is the conservative, wait-till our competitors come-out attitude of Union Pacific-Northwestern. It is reliably reported that the Pacific Coast streamliner service of this great combine will be daily Diesel before long. Santa Fe already has enough Diesels on order to 100% Dieselize its main line passenger service from Chicago to the Gulf and the Coast, and enough Diesel freighters to completely Dieselize its vast freight operation for 680 miles west of Winslow, Arizona. Coal burning and coal-wedded systems like Louisville & Nashville and Illinois Central, carry water neatly on both shoulders by going in for bigger and faster Diesel passenger service, and are adding more trains, but keep their coal people happy by publicly proclaiming steam will never die on our freight service! The same old tongue-in-check attitude that has kept public acclaim from creating favorable emotional-goodwill toward the Dieselized railroads for ten long years!

At least two dozen huge new "railroad garages"—the modern brick, steel and glass brick Diesel shops are being erected strategically around the country. In some cases their owners are saying nothing about their future plans for Dieselization but are spending up to \$500,000 on individual Diesel shops! Quaint, isn't it! But this kind of thing merely indicates the trend toward Diesel has risen to a tidal wave and suppression of news by some misguided railroad presidents is merely being politely two-faced.

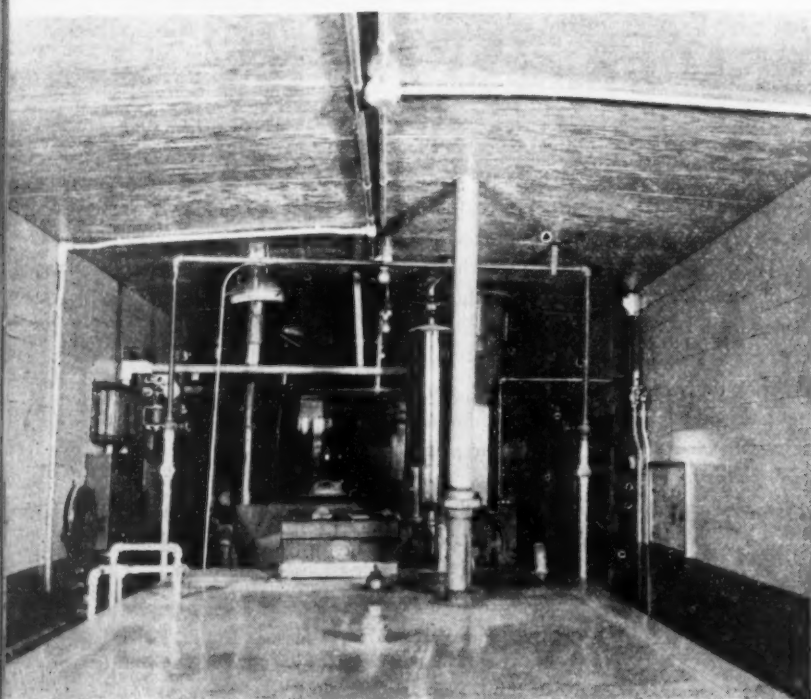
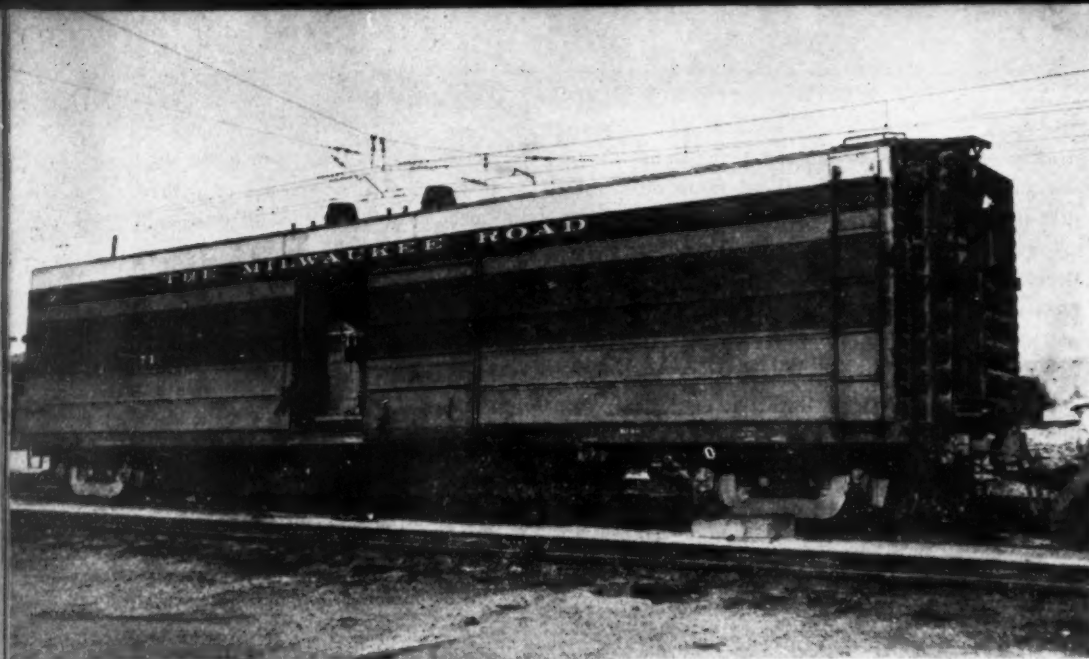
Offtrack Diesel equipment orders, that little-known subject of profound importance to directors and chief engineers in charge of roadbed, bridges, tunnels and grading, is taking on the proportions of a wartime boom in contractors Diesel equipment. The old-fashioned steam worktrain, that blocked the main lines for days on end, will vanish into the limbo by 1946-47, and the husky little Diesel engines will run the scrapers, bulldozers, air compressors, portable power plants in huge new quantities. Diesel offtrack usage will once more restore the posi-

tion of chief engineer of a railroad to the dignity to which he is entitled—instead of a dirty so and so to be chased onto the side track and Glueville, by an irate dispatcher trying to get his main trains and perishable freights over the line ahead of the Evening Zipper.

The persistent efforts of the Bituminous Coal Institute to belittle the Diesel by expending large sums of money foolishly trying to offset immutable laws of mechanics, heat, physics and sound railroad technique, is, surprisingly, not setting well at all with most railroad executives. They secretly all wish the Bituminous Coal Institute people would stop forever trying to embarrass them in their efforts to reduce costs, improve efficiency, make working conditions cleaner, safer and life more thrilling for the shipper and traveller, by their constant derogatory blasts against Diesel locomotives. Instead, practically all the some 300 railroad officials I have contacted in 1945, in search for the truth about Diesel, pray that the coal people will try to create brand new markets for locomotive coal by a mass-selling scheme to get small stokers into every home, building and apartment house now burning oil or hand-firing the fancy, high priced lump coal. And go strong for chemical research into making new products from coal. But anything just so long as they quit their senseless efforts to make railroad executives who buy Diesels look like fools in the public prints.

For example, as much as we are Diesel-minded, it is my personal opinion that the Chesapeake & Ohio has the soundest idea yet developed for a coal-burning locomotive. The boiler, stoker, accessories, running gear, steam turbine, etc., are all as near standard, proved products as you can find. Electric traction was invented 60 years ago and nothing yet devised since excels it for the peculiarities of railroad tractive and transmissive requirements. Yet because the Chessy's turbo-electric, coal burners, all three of them, are good ideas of their kind, it does not follow they will produce anything to stem the tide of Diesel. Chessy is one of but nine U. S. railroads that can afford to indulge in the luxury of a steam locomotive with such terrific axle weights; it is one of but a half dozen financially able to afford the operating losses this type machine will create and it is one of but four railroads whose freight traffic and shipper-politics can be used as an excuse to tinker with such a machine. Very few railroads could afford to build a roadbed to operate such a machine on and still stay out of receivership.

But Chessy will please their coal shippers; the . . . And now please turn to page 68 . . .



The Milwaukee Railroad's heater car, powered with Diesels, photographed at Othello, Washington where Diesel and electric road operations meet.

View looking over water and fuel tank showing heating boiler and Diesel-generating set in background. In the center foreground is seen the Globe engine-starting battery and just right and above it a Burgess snubber.

NOVEL DIESEL "HEATER CAR"

By CHAS. F. A. MANN

AS the range and economic usefulness of Diesel locomotives grows, and the trend on U. S. railroads continues toward multiple-usage of a single type of locomotive—freight, switch, passenger, transfer, or "branchline mixed"—all kinds of motive power use from a single type of Diesel locomotive, ingenious schemes to help this trend along seem to crop up.

It apparently remained for the Milwaukee Railroad to neatly solve a problem in moving their tremendous loads over the Western lines, in the construction of twin "Heater Cars" to permit not only their small fleet of big 5400 hp. Diesel freight locomotives, but some 30 giant electric freight locomotives to all pitch in and pull passenger trains at will.

Far out in Montana, a speeding passenger train may reach Harlowton, eastern limit of the 440 mile Montana electrified zone, and there will be no passenger locomotives there to quickly replace the big steamer that brought the train from Minneapolis. So what do they do??? Well, they back up one of the giant 2-unit electric freight locomotives to a novel car known as a "Heater Car," resplendent with bright orange and red Milwaukee coloring, looking like a small-size baggage car that sometimes pinches on passenger trains. Then they hook this team up to the passenger train and start rolling West at 70 mph.

The long wait to "turn" an Eastbound passenger locomotive is eliminated. Perfectly good freight power suddenly becomes passenger power, and with one operation the operating percentage of the availability chart zooms up toward the 90% mark, which pleases the operating department back in Chicago—and you again have an illustration of one locomotive doing the work of two. And most interesting of all, was the fact that the Diesel's unique operating characteristics taught the electric locomotive operators this equipment-saving trick, instead of vice-versa. But that is not all.

Our big Electric yanks the passenger train through the Rockies, twice, and then over the Bitterroots to Avery, Idaho, the Western end of the Montana electrified zone. Here the main line goes across the narrow Idaho Panhandle to Plummer Junction, one line going to Spokane, the other direct to Marengo, Wash., where the two lines join and run West to Othello, beginning of the Cascade Mountain electrified zone.

Across this gap, as readers of DIESEL PROGRESS will recall, it was steam operation till two big 5400 hp. Diesel freighters went to work a couple of years ago. Now with four and sometimes six, all freight and regular passenger traffic is "ferried" across this 200 mile gap in the Milwaukee's Western electrification by Diesel and but two huge, specially designed steam passenger locomotives. And there's the rub.

Our passenger train probably follows the Olympian, crack passenger train. So the big steamer is busy and cannot pick up the people at Avery.

So again the Diesel "Heater Car" is useful—it stays right on the passenger train, while one-half of a big 5400 takes over and hauls it to Othello. From there, normally, a big Bipolar gearless passenger electric, with a big heating boiler, takes it to the Coast. But, if there are

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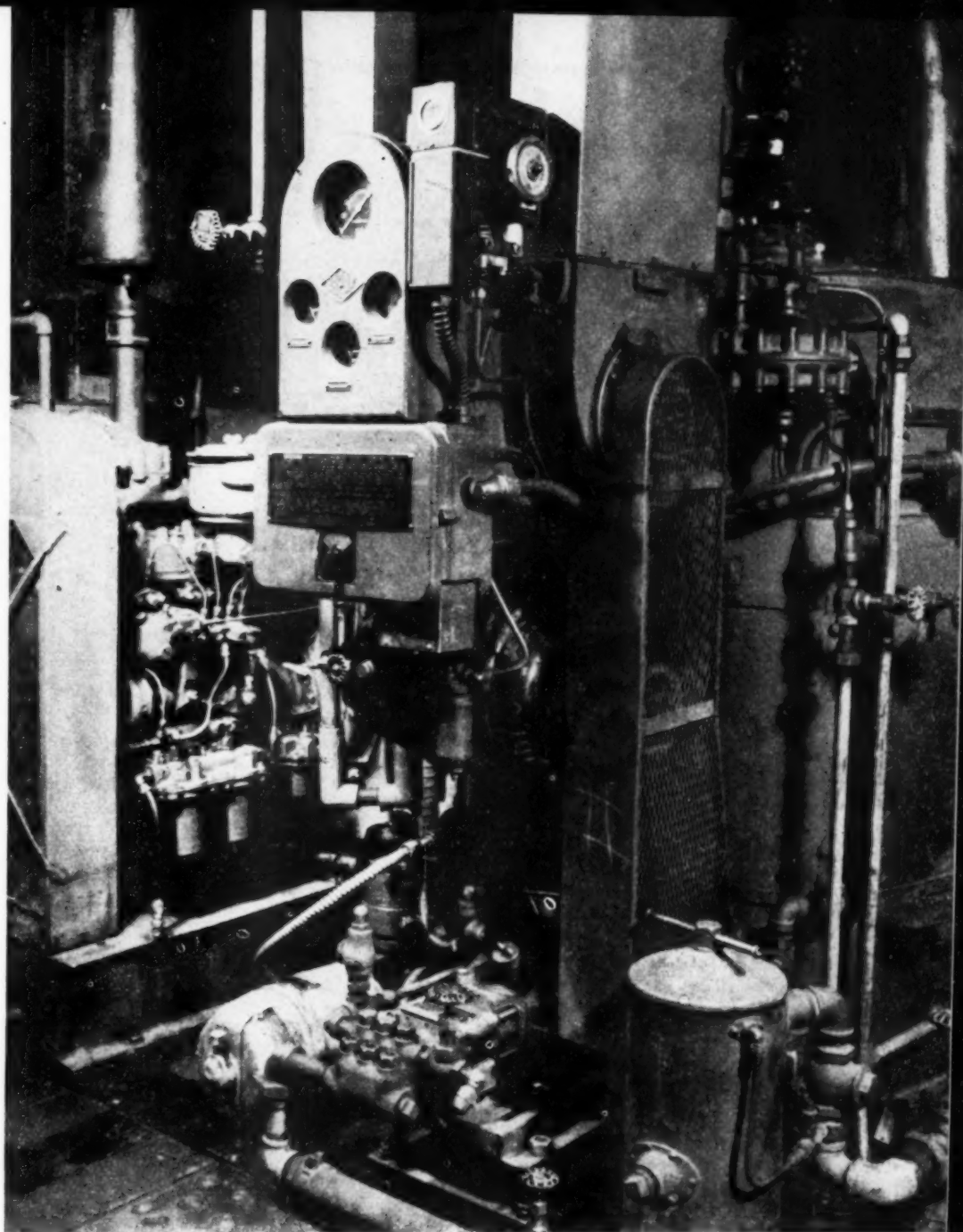
GRESS

no Bipolars available, chances are that either a big 2 or 3 unit Electric freight locomotive or the same Diesel freight locomotive, will carry right on through to the Coast. Thanks to the ingenious use of the two "Heater Cars," Nos. 70 and 71.

From a practical operating standpoint, these Diesel Heater Cars are very useful gadgets. For months, now, the Olympian has been running both ways into Seattle-Tacoma in two or more sections. The Othello-Avery gap, gradually working into a 100% Dieselized operation, has found itself shuttling loads at such a pace that its small fleet of big Diesel freight locomotives simply never shut down. They drag 4-5000 tons one way, fill up with sand, fuel and radiator water and go right back again. One or two are operated, as a rule, as two 2700 hp. passenger Diesels, being geared for 75 miles per hour, and capable of moving 12 heavy Pullmans without a helper on this stretch of line. Invariably, almost, they handle 2nd and 3rd sections of the Olympian besides additional troop trains. Without the large-capacity Heater Cars such moves would be impossible. And when one or both of the electrified zones are using their passenger power to capacity, it is not an uncommon sight in Seattle and Tacoma to see the first section of the Olympian come rolling into Puget Sound of a morning, pulled by its regular Electric; and right behind it, the second section being pulled by a 2700 hp. Diesel freighter, with its Heater Car attached.

The Heater Car is essentially a modified, light-weight box-baggage car, equipped with passenger train controls, steel sides and underframe and passenger-type 4-wheel trucks and the proper trainline at the ends. Doors are fitted at the ends as well as on one side, like a box-car, to give easy access to the twin Clarkson Vapor oil fired heating boilers, the air compressor and the Diesel generating set. Inside lining of the walls and ceiling is tongue and grooved wood and thick plywood. The cars were built complete in the Milwaukee's own shops, at Milwaukee.

To assure proper balance of weights, there are 2,000 gallon water tanks at each end, directly over the trucks and 500 gallon fuel tanks at the inner end. Each of the water tanks are approximately 11 ft. long by 5½ ft. wide and 4 ft. high, of welded steel, and the fuel oil tanks are the same width and height but only 3 feet long (fore and aftwise). Thus with 1,000 gallons of fuel oil and 4,000 gallons of fresh water, this car can operate with a heavy passenger train over long runs. The Vapor-Clarkson boilers are



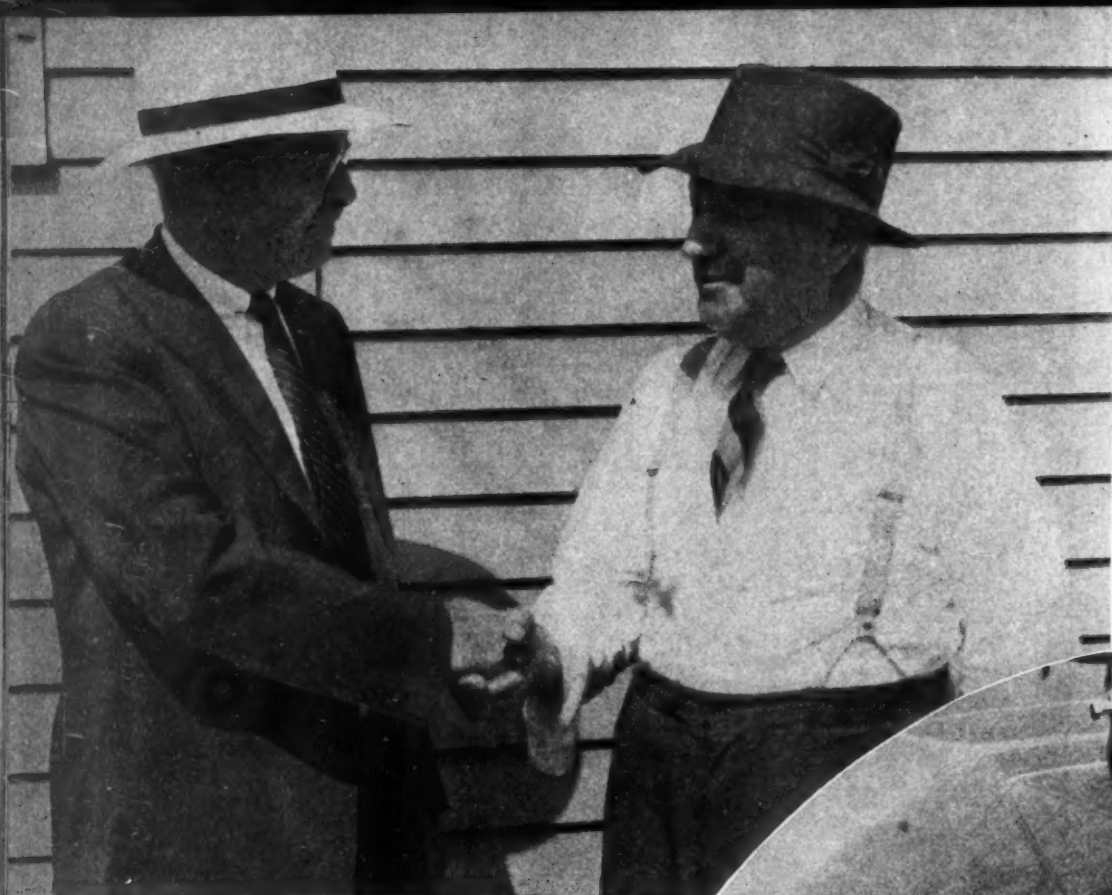
Close up of Hercules Diesel, left, and the Vapor-Clarkson heating boiler, right, on the Milwaukee Heater Car No. 71.

of large capacity, and have their typical top burners; forced draft and steam separators as well as water treatment tanks in the feedwater circuit.

Power is supplied by a 4 cylinder Hercules Diesel, equipped with Air Maze filters and 3 Purolators, and American Bosch fuel pumps, developing approximately 25 hp. A 15 kw. U. S. Motors 74 volt, D.C. generator is fitted, and electric starting is provided by Globe battery set mounted on top of one of the tanks. Square D switches are used for the electric circuits. A De Vilbiss air compressor is fitted to supply control air for the Clarkson boilers.

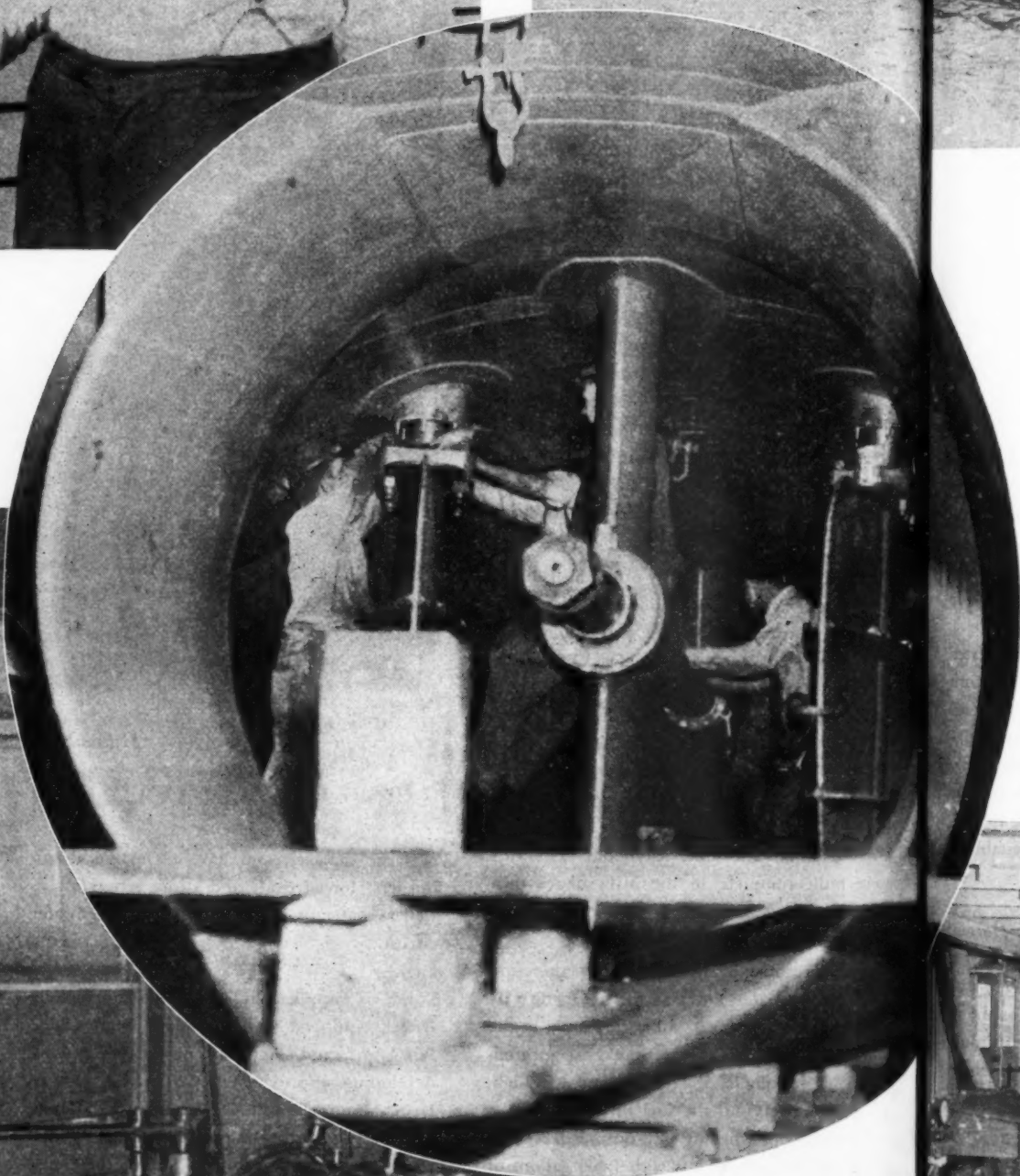
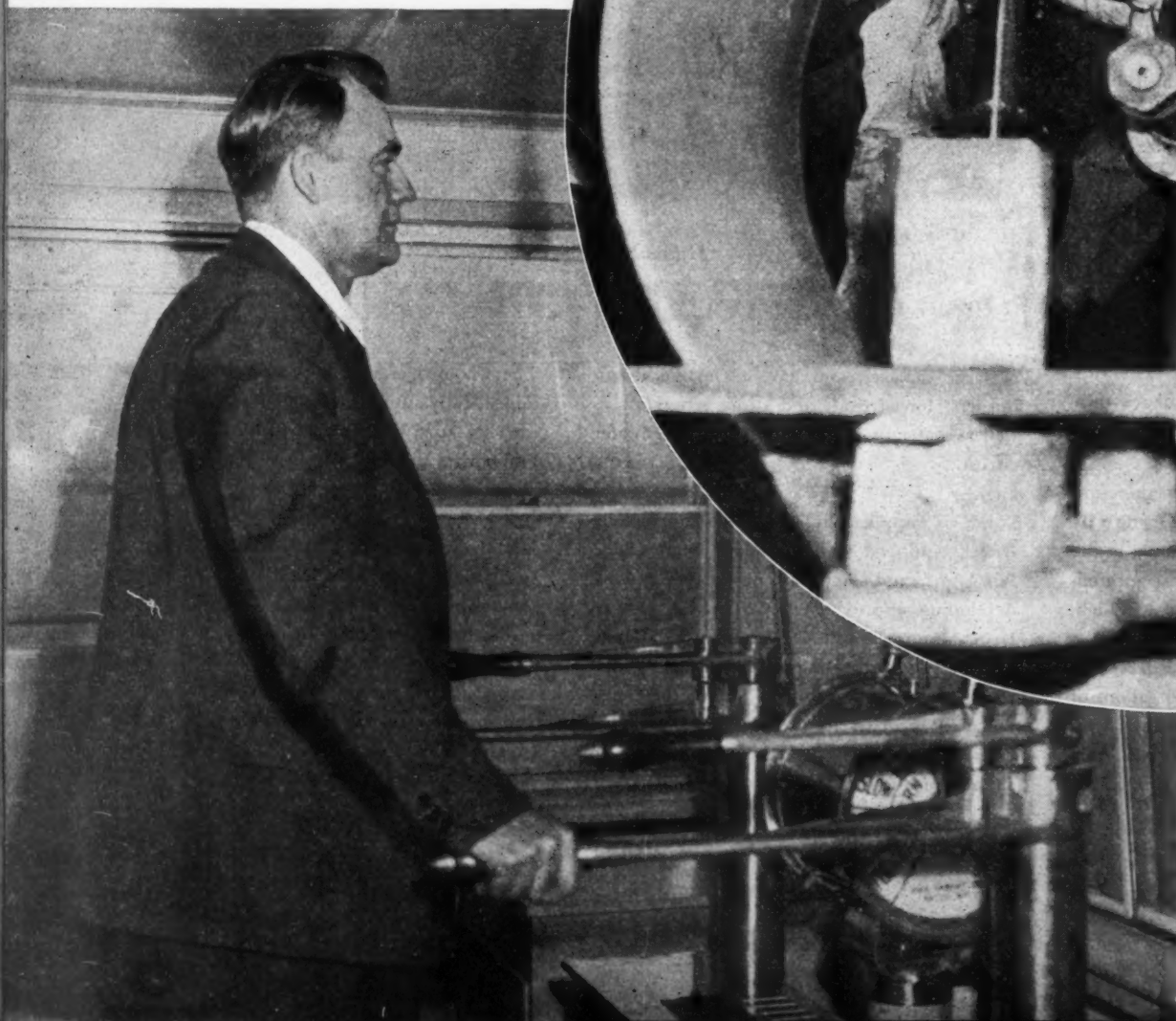
The whole operation is practically a self-contained, fully automatic installation, of the same capacity used on Diesel mainline passenger locomotives to handle up to 20 car streamlined trains.

Use of the car eliminates all troubles of trying to hybridize the freight Diesels into something they were not quite designed for. A Diesel set up for freight, can never be as efficient a freight Diesel if once altered to haul passenger trains, except in rare cases where low grades and curves and peculiar operating conditions bring the overall limits of steam, water capacity and load factors into favorable juxtaposition.



John I. Hay (left), president of the John I. Hay Company, barge line operators and James A. Rogan, president of the Calumet Shipyard and Drydock Company, builders of the "George T. Horton."

Captain Roy A. Miller of St. Louis, at the rudder controls as he heads his boat into the Chicago River on her maiden trip down river.



View looking forward through the starboard Kort nozzle. Use of nozzles increases effective power by 20%.



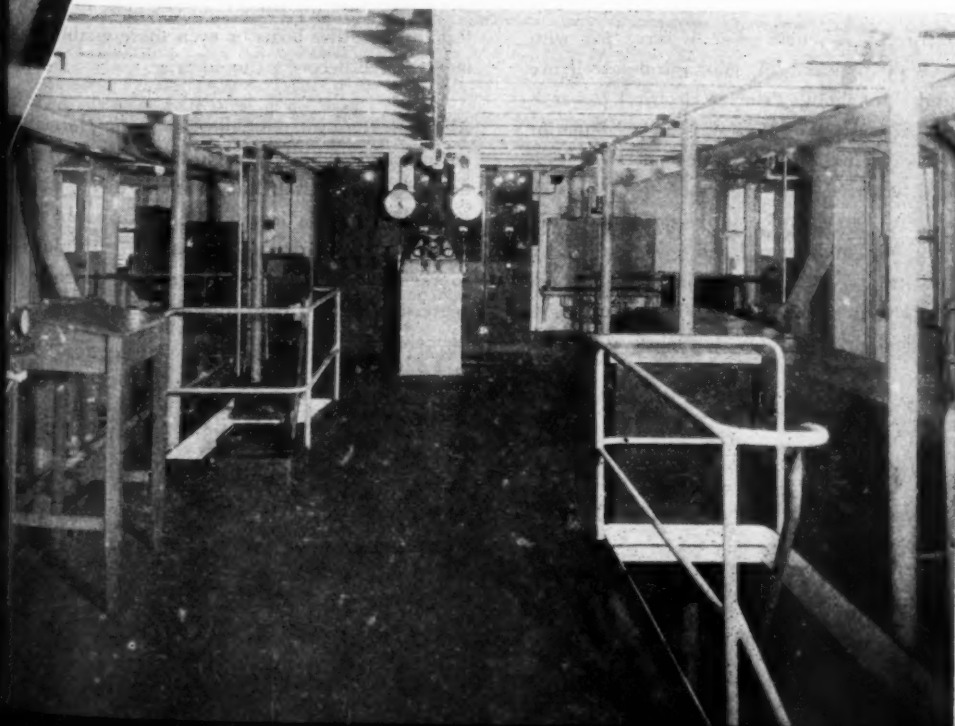
Newest addition to the John I. Hay Line on trial run in the Chicago River.

MODERN

DIESEL TOWBOAT

"GEORGE T. HORTON"

Upper engine room view showing tops of the two main Superior Diesels, right and left and engine control stand, center rear.



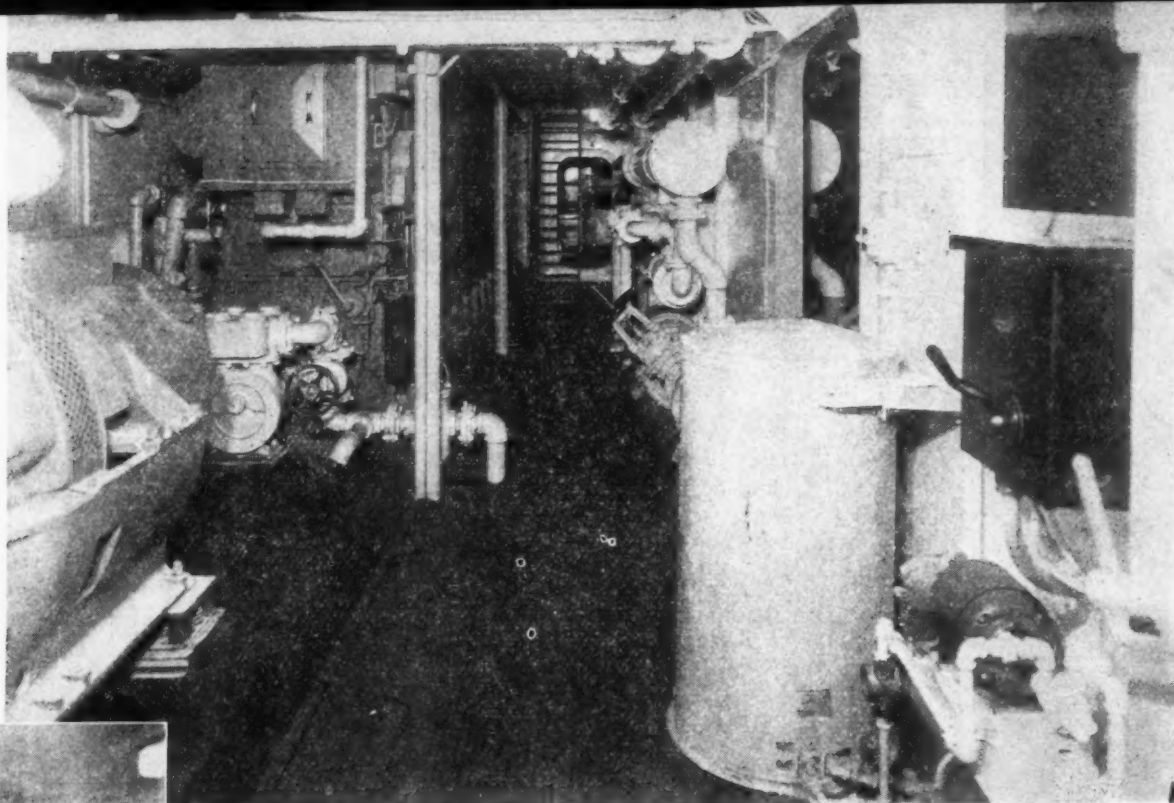
By DWIGHT ROBISON

A SUBSTANTIAL contribution toward the solution of this country's commercial transportation problem was recently made by the officials of the John I. Hay Company when they accepted and placed in service their newest and most modern Diesel towboat, the *George T. Horton*. This able vessel was designed and built for the Chicago barge line by the Calumet Shipyard and Drydock Company and carries the name of the late president of the Chicago Bridge & Iron Company. Her recent highly successful trials on the Chicago River indicate that she will do full justice to her name.

To appreciate fully the benefit of this addition to our war-depleted common carrier facilities it should be noted that this new 150 footer, powered by two 1000 hp. turbocharged Superior Diesels, is designed to push a barge cargo capacity of ten thousand tons, which is equivalent to the lading of two hundred freight cars, at an average speed upstream of four miles per hour.

To the average citizen, this new craft means that peacetime goods will get to market sooner and in greater volume, but to her owners and to river shippers between Chicago, Peoria, St. Louis, Memphis, New Orleans and Houston the characteristics and equipment of the *George T. Horton* carry much more significance that is worth serious consideration by others engaged in inland and coastal waterway commerce.

Her twin, direct-reversing, main propulsion Diesels assure maximum maneuverability for negotiating restricted channels and will provide economical, dependable power with minimum maintenance in both time and money for years to come. The heavy-duty Superior Diesels carry Elliott-Buchi turbochargers and transmit their power through Bethlehem 84 inch, four-bladed propellers, each mounted within a Kort nozzle supplied by Dravo. Kropp Forge main drive shafting is borne by self-aligning S.K.F. pillow block bearings and thrust is taken by Kingsbury thrust bearings. Rated shaft speed at full power is 275 revolutions per minute. With a beam of 35 feet and a draft of seven this provides the pilot with excellent control of his heavy tow, so essential for navigating through year-round weather and traffic conditions. Burgess snubbers effectively quiet main engine exhaust pulsations, while for the con-

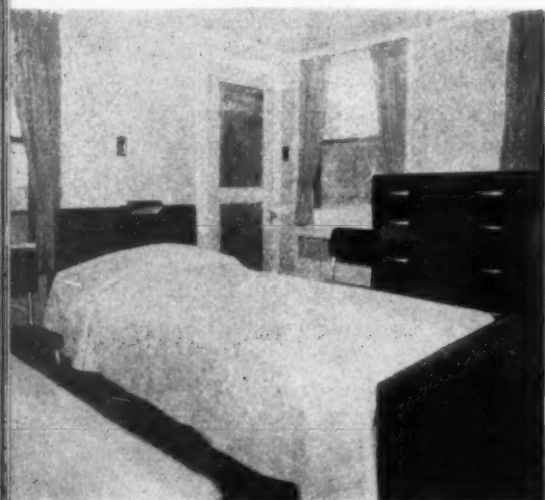


View looking between the two main Superior, Elliott-Buchi turbocharged Diesels. Honan-Crane lube purifier is seen, left foreground.



One of several comfortable lounges on the "George T. Horton."

Typical of the spacious and modern staterooms on this towboat.



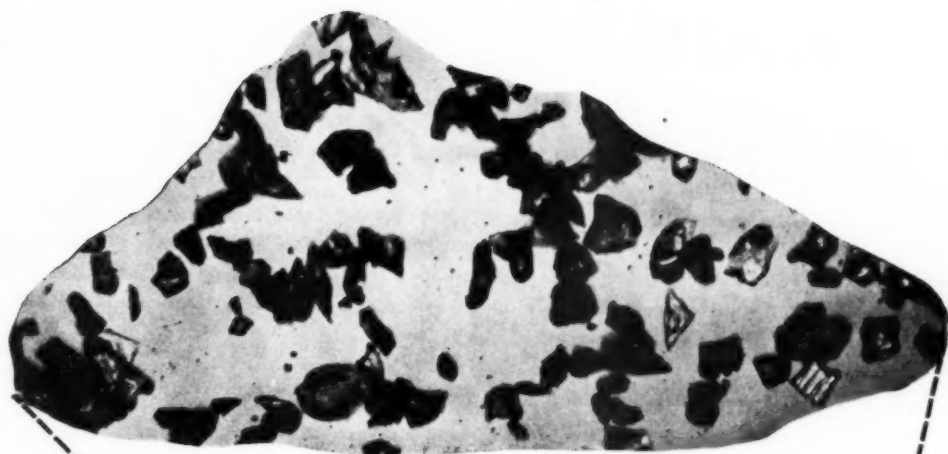
venience of engine room crew in checking cylinder temperatures Alnor pyrometers give instant readings. These small but highly important instruments are the "ounce of prevention" which, if intelligently used by a good crew, will prevent minor ills from becoming major headaches. Other main engine equipment includes a Roper lube oil pump, Marsh pressure gauges, Chicago flexible metal hose and a Blackmer fuel oil transfer pump. Also, under the head of preventative maintenance are the Honan Crane fuel and lube oil purifiers which keep impurities at a safe distance from precision parts. The engine room itself is supplied with ample quantities of fresh air by American blowers.

Electrically, this new vessel is on a par with the high standard of mechanical excellence found throughout. Primary electrical power is supplied by two 60 and two 25 kw. Superior Diesels driving Burke electric generators with Exide batteries floating on the line. The well laid out switchboard was designed and built by the shipbuilding yard and nicely satisfies all requirements with rugged simplicity. Above decks are ample Carlisle & Finch searchlights and floodlights for any emergency as well as

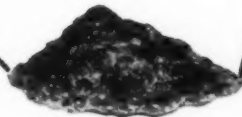
for routine operation.

Probably nowhere afloat are crews so well housed as on river towboats and this vessel is no exception. Crew quarters are as comfortable as any modern city apartment and are complete with showers and several lounges. Crane plumbing and fixtures have been used exclusively with plenty of service water pressure supplied by a Fairbanks-Morse sanitary pump. Drinking water is first passed through an Elgin filter before being piped to fountains, which are conveniently located for all hands. Built-in York refrigerators have a food capacity for thirty days. Nor has crew safety been neglected. A Dayton Dowd fire pump is more than adequate to protect this or other boats or even shore establishments if the necessity should arise.

Although the owners of the *George T. Horton* have been established as a company only a decade they are well known along the Mississippi as strong believers in the expansion of inland waterway commerce. This latest addition to their fleet is a concrete example of their aggressive faith in the future of this type commerce.



did you ever see **DIRT** before?



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Unfortunately, your products, machinery, merchandise or even customers and workers find dirt harmful—and without the help of a microscope.

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SUPERVISING & OPERATING ENGINEERS' SECTION

Conducted by R. L. GREGORY*

"Factors Contributing to Operating Costs"

Part III

CONTINUING our discussion of the above subject, we now come to the matter of fuel, which is one of the most vital factors affecting operating costs. It is vital not only from the point of economy to secure the proper fuel to maintain proper combustion, but it is also vital from the point of maintenance, since the type of fuel which one uses has its effect on the mechanical parts, and any item which affects the mechanical parts of the engine, naturally affects maintenance costs.

Most all of our Diesel fuels are the byproducts of cracking plants, at least a good majority of them are. After the crude has been subjected to high temperatures under high pressure, to extract the lighter fuels such as gasoline, light fuel oils, etc., we find that the residue consists of the heavier portion of the original crude. Now in a majority of cases this residue, when properly handled can be used to good advantage in large Diesel units whose fuel system and injection system is adapted to that type of fuel.

Naturally such fuel, being a by-product, is less expensive in the long run, but there are limitations to such fuel also. It being a by-product, such fuel contains a higher percentage of foreign matter, such as ash, sulphur, etc., and in using such a fuel one must always be on the alert to apprehend the amount of these foreign materials which may affect the mechanical parts of the engine such as the fuel pumps, atomizers, etc. The amount of such foreign material can be ascertained through laboratory tests of your fuel at periodical intervals. However laboratory tests are not enough to tell the true story of the effect of fuel on the engine and its various parts and is a poor substitute for actual engine tests.

There too is such a thing as carrying the use of these heavy grades of fuel oil too far. By that I mean that one can go on the market and procure a pretty heavy fuel oil at a reasonably low price, but before doing so he should be aware of the chemical analysis of the oil and if he decides to use it, check this analysis periodically. There are several fuel oils in the lower

* Chief Engineer, Municipal Water and Light Plant, Hillsdale, Michigan.

price range, which with the proper handling by either centrifuging or purifying can be adapted to use in engines equipped for these heavier fuels. However one must consider the plant conditions, cost of purifying with these lower grades of fuel, and strike a balance against the cost of a better grade of fuel with less handling and treatment.

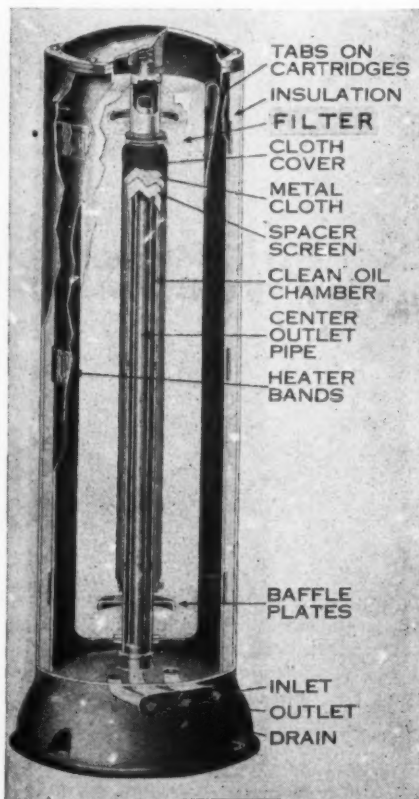


Fig. 1.

Figure 1 shows a type of fuel and lubricating purifier which is popular with many Diesel supervisors. Its construction requires an occasional refill or change of the filtering element, which renewal is not expensive if used on the proper kinds of fuel. By that statement I mean fuel with a minimum of moisture and other foreign ingredients not conducive to good filtration. Some engineers labor under the impression, that a purifier will eliminate all their troubles regardless of the type of fuel they use. This seems to the writer to be entirely the wrong attitude to assume, since it is unfair not only to the product but also to the manufacturer. They will purchase a low grade of fuel

oil, with a lot of foreign matter and moisture, then pass it through a purifier and expect that their troubles will end. But before they know it the purifier has ceased to function.

The filtering agent in most of these types of filters consists of a cloth or felt container, filled with retrol, fullers earth or some other similar agent. The oil is passed through it by means of pumpage, the agent picking up the foreign matter and allowing the clean fuel to pass on to the fuel pumps and injection equipment, or to the day or service tanks, depending upon the location of the purifier in the fuel supply system. Now if the fuel contains foreign matter in excess or moisture to excess, the filtering agent soon becomes clogged and a refill charge is necessary.

Therefore one can readily see that the life of a refill charge depends wholly upon the type of fuel to be filtered, and that it would be much more inexpensive to buy a fair grade of fuel, and thoroughly filter it, than it would be to buy a cheap grade and be recharging the purifier more often.

The question often arises as to just what type of fuel is best suited for operation, not only from the efficiency standpoint, but also from the point of freedom from impurities. It is always best to first ascertain the manufacturer's recommendation as to the fuel to be used, since engine test is the best proof. However, one can use the A.S.T.M. recommendations as a guide, which are as follows:

Grade 1-D Used in solid injection engines operating over 1000 rpm.

Grade 3-D Used in solid injection engines operating at from 360 to 1000 rpm.

Grade 4-D Used in air injection engines operating under 400 rpm. Also in solid injection engines operating under 240 rpm., when the diameter of the cylinders exceeds 16 inches.

There are some engineers who like to use fuels even heavier than the Grade 4-D, but since the prime factor in selecting a fuel is the fluidity, measured by its viscosity and pour point, the heavier fuels, especially those from a paraffinic base, require a lot of preheating. This means

... And now please turn to page 74 ...

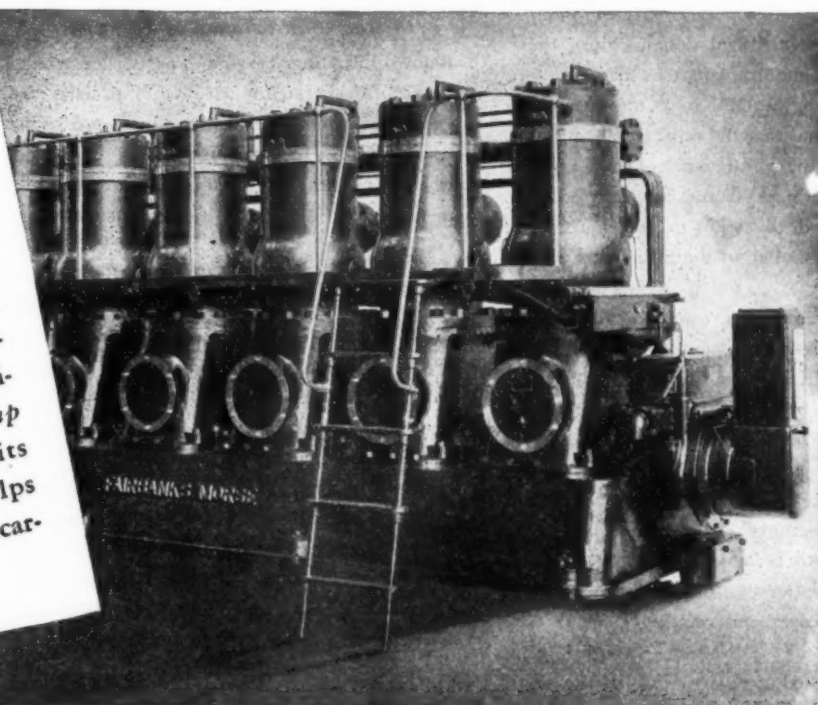
FOR DIESEL ENGINE

CLEANLINESS



SINCLAIR GASCON OIL

GASCON is made from crudes possessing characteristics which give the oil a natural ability to "wash" away and disperse carbon and sludge accumulations from interior parts. Besides its efficiency in *cleaning up* accumulated deposits Gascon Oil also helps prevent formation of carbon and sludge.



TWELVE YEARS' highly satisfactory operation of 11 Fairbanks-Morse Diesel engines with Sinclair Gascon Oil, is reported for a Southern installation. The engines are in drainage service, pumping continuously during six months' rainy season. Minimum carbon and low maintenance cost are recorded, compared to prior trouble with hard carbon, stuck rings, and clogged parts when another oil was used. Wouldn't use of Sinclair Gascon be advantageous to you? A lubrication engineer will gladly consult with you at your request.

SINCLAIR INDUSTRIAL OILS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N. Y.

Exchange Your Diesel Maintenance Ideas

Conducted by R. L. GREGORY

Editor's Note: In this department we provide a meeting place where Diesel and Gas engine operators may exchange mutually helpful maintenance experiences to keep our engines in top condition. Mr. Gregory edits your material and adds constructive suggestions from his own wide experience. This is your department—mail your contributions direct to DIESEL PROGRESS.

Maintenance of Centrifugal Pumps

AMONG the most important auxiliaries, found in Diesel plant operation are the pumps, usually of the centrifugal design. Since these pumps play an important part in the operation of the plant, they should have the same care and consideration that the units proper receive. In carrying on the maintenance of these pumps, certain definite steps should be followed and conditions noted, so as not to find yourself in a predicament similar to the following.

We recently received a communication from an engineer relative to one of his pumps. This pump had been in operation for about three years and had been operating practically constantly, but he began to experience trouble in the nature of a gradual loss of pressure. Thinking that perhaps either the suction or discharge lines were becoming clogged he dismantled these, but found them all in good condition. His next move was to dismantle the pump, removing the cover and rotating element.

Inspection showed excessive wear of the shaft sleeves under the packing, the tolerances of the wearing rings were excessive and the vanes and impeller worn. Having a spare impeller with wearing rings, and a new set of shaft sleeves and nuts in stock, he renewed these parts, and reassembled the pump, connecting it to the motor. After having the pump in operation for a short time he noted that the pressure was back to normal, but the thermal overload coils on the starter kept tripping out and the motor ran at a considerably higher temperature than it previously had, even when new. The fact that the overloads had functioned satisfactorily during the previous months of operation and were now kicking out should have been indication enough that his motor was overloaded. The question then arose as to why the motor should now be overloaded.

Well there are several causes for this condition which may be enumerated as follows:

First—Misalignment

If in dismantling the unit, either the pump or the motor or both were removed from the base and the original alignment disturbed, it is possible that in reassembling the unit, that perfect alignment was not obtained. Pumps must be properly aligned in order to secure satisfactory operation. In reassembling any pumping unit this should be a matter of first consideration.

Second—Installation of new parts

Before installing the new parts, the casing should be thoroughly cleaned, especially the grooves in which the wearing rings, and baffles rest, as well as the packing grooves. Then too, when dismantling a pump, accurate measurements should be noted as to clearances and tolerances of the various parts. Then the new parts checked. Oftimes in machining of new parts, an error of a few thousandths will cause a lot of trouble. If the wearing ring grooves are not thoroughly cleaned, so that the rings will seat properly, when the cover is replaced and pulled down a pinch is effected, causing the rotating element to turn hard, due to excessive bind or friction. Therefore it is always good practice, after reassembling the pump and before coupling it to the motor, to ascertain whether the rotating element will turn freely by hand. This should also be noted after coupling to the motor and before the unit is placed in operation.

Third—Packing

The proper grade of packing should always be used; avoid a dry hard packing as it is easier to replace packing than it is shaft sleeves and other parts. After the stuffing box has been thoroughly cleaned, each ring of packing should be installed separately and drawn to place. The lantern or leakoff rings should be cleaned and installed, with one half the packing on each side of the rings, or if the pump is equipped with water lubrication on the packing to help seal off the air leakage, these lantern rings should be placed directly under this point. As the rings are installed it is well to use plenty of oil and graphite on them as this will help the packing work in. When the packing is installed, the packing gland should be pulled up squarely and just finger tight, or if you desire to pull it somewhat tighter in order to seat the rings, then slacken off slightly to allow for packing expansion.

It is often advisable to allow the box to leak slightly to allow for proper expansion and seating.

Pulling the packing gland too tight will cause undue friction on the wearing sleeve when expansion takes place and increase the power required to operate the pump. Instances have been known, where by slightly loosening the packing glands on a pump, the overall efficiency of the unit has been increased several percentage points.

Fourth—Lubrication

This too is of vital importance. The oil wells should be well cleaned and filled with a good grade of mineral oil. Mineral oil is suggested since experience has taught engineers, that an oil compounded from an animal or vegetable base has a tendency to gum up, which is hardly desirable.

If the pump or motor is equipped with ball bearings or ball bearing thrusts, lubricated with grease, care must be taken in using the proper grade of grease and have the bearing only partially filled. Ball bearings filled or packed too tightly will also heat up causing undue friction.

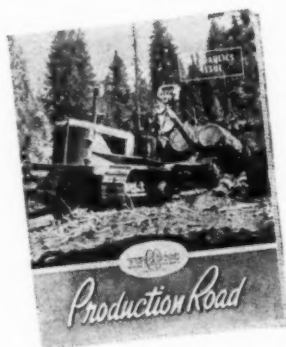
Fifth—Piping connections

In reconnecting the piping to the pump, after reassembly, care must be exercised to see that no strain is exerted on the pump casing by pulling up too tightly. This strain of trying to pull a pipe, which has not been properly measured and installed, up squarely to the face of the pump flange connection will distort the casing and alignment trouble oftentimes ensues. Piping should be so measured and installed that the connections come up squarely without strain.

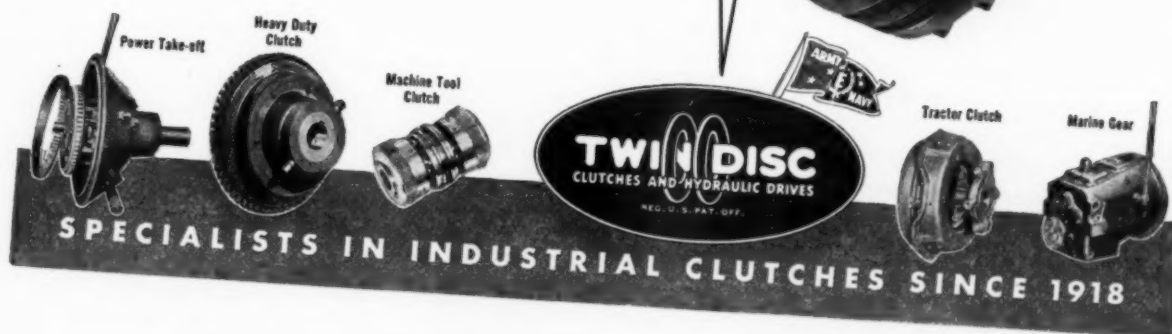
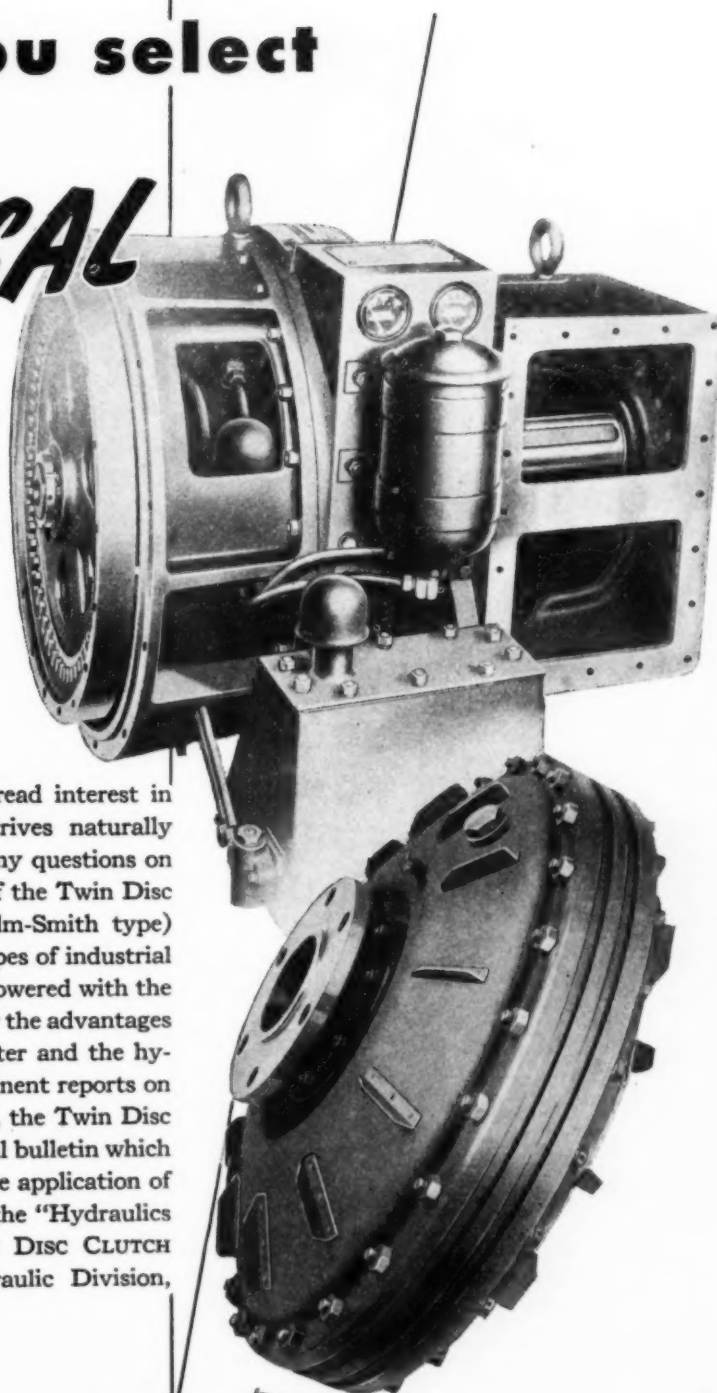
Sixth—Shaft wearing sleeves

Where shaft wearing sleeves are used on the shaft to take the wear of the packing friction, care must be taken to see that they fit snugly on the shaft. It is always good practice to coat the shaft with white lead and oil, doing so before slipping the shaft sleeve in place and pulling up the shaft nut. This coating eliminates any air which might pass between the shaft . . . And now please turn to page 74 . . .

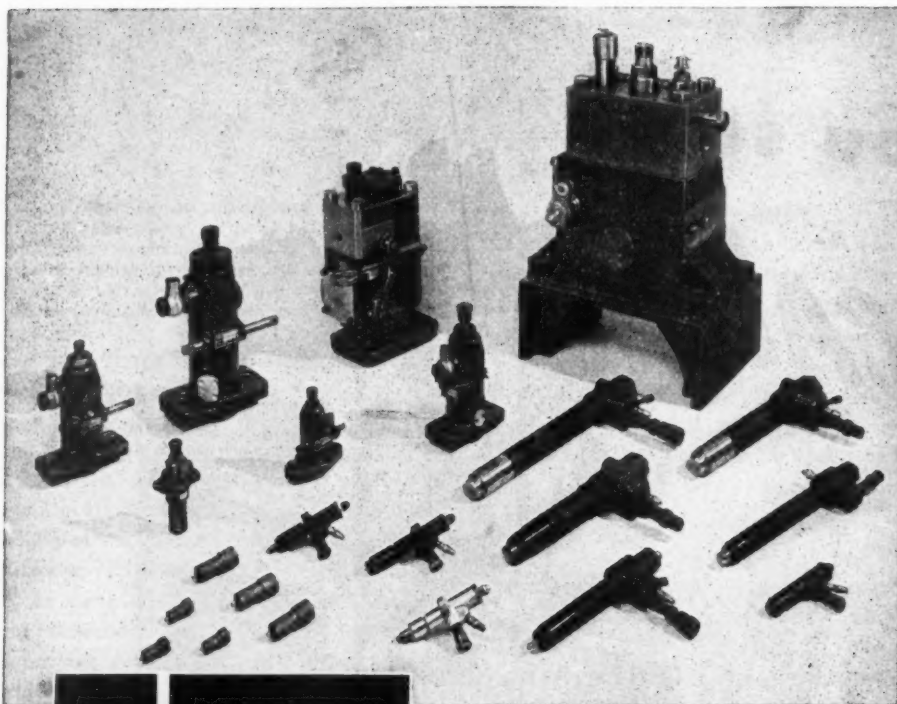
To help you select the most **PRACTICAL** unit



The widespread interest in hydraulic drives naturally leads to many questions on the practicability of the installation of the Twin Disc Hydraulic Torque Converter (Lysholm-Smith type) and the Hydraulic Coupling for all types of industrial equipment—motor driven as well as powered with the internal combustion engines. To clarify the advantages of each—the hydraulic torque converter and the hydraulic coupling—and to provide pertinent reports on various installations now in operation, the Twin Disc Clutch Company has prepared a special bulletin which will be sent to anyone interested in the application of hydraulic drives. Write for a copy of the "Hydraulics Issue" of *Production Road*. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).

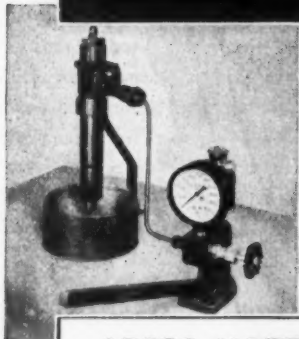


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Whether you need standard fuel injection equipment or special units built to your specifications, Adeco offers the logical source of supply.

Today's line of Adeco equipment, the outgrowth of long experience in serving the Diesel industry, includes: Standard fuel injection pumps in plunger diameters from 7 mm. to 31 mm.; a complete line of standard nozzles and nozzle holders, including the water-cooled type; and the Adeco nozzle tester.

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Railroad Dieselization,

Continued from page 57

Bituminous Coal Institute and the publicity they'll get will more than offset the paltry \$1,500,000 these fine, handsome machines will give Mr. Newton & Co. at a time when their corporate strategy needs some good train-locomotive publicity!

Diesel people can just relax till 1947. Then Chessy will buy some 4,500 hp. Diesels and pull their new Cincinnati-Washington streamliners!

People like the Boston & Maine and the South Atlantic Coast Railroad operators who pay \$6 a ton for locomotive coal simply cannot afford to burn coal any more—so they're going Diesel as rapidly as they can acquire locomotives. Naturally.

The dawn of the 100 mile per hour is here. The Atlantic Coast Line is gradually approaching 70 miles per hour scheduled speed with its Diesel freights. Three stops in a 600 mile freight run, the longest being 9 minutes in a terminal to refuel and change crews, began as a daily habit with them November 13, on their New York perishable moves from Florida.

Five railroad systems are developing whole terminal-to-terminal stretches of 100% Diesel operated main line, and by 1946 seven or eight more are to join this picture.

Gone is the experimental era of Diesel railroad-ing. The locomotives are coming off their far-flung test runs and are being pooled for 100% Diesel operation over 300, 600, 1,000 and 1,500 mile solid stretches of main trunk line. The hybrid steam-Diesel day ended in 1945 with the end of the war. Further economies of all-steam and all-Diesel divisions and groups of divisions is the operating practice from now on in.

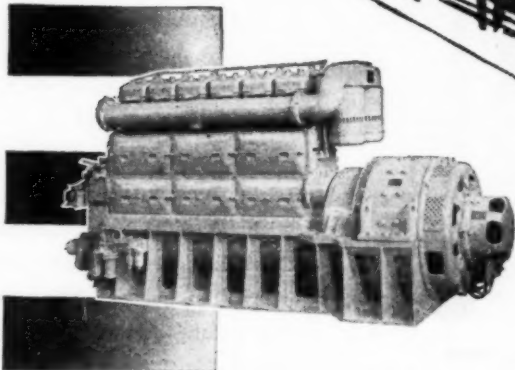
Florida trains are being projected on 18 hour schedules to Jacksonville from New York. Day coach de luxe streamliners are in the works for New York to Chicago in 15 hours, 1,000 passengers in luxurious coaches at 2 cents per mile and no extra fare are likely by 1947. A 35 hour Chicago-Pacific Coast streamliner is in the wind. Sleepy old Southern Pacific is talking of a 14 hour San Francisco-Portland coach day streamliner, but can't figure out how to run its clumsy articulated-consolidation steamers (cab in fronts) fast enough to make the schedule! The Midwest, with a half dozen big operators, turns up another interesting forecast: Every Midwest railroad now operating Diesel streamliners—a few trains scattered over their . . . And now please turn to page 72 . . .

MODERNIZE

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WITH HAMILTON DIESELS

FOR SAFETY AND ECONOMY



Hamilton 400 H. P.
900 R. P. M.—4 Cycle Diesel Engine adapted to original
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Railroad Diesellization,

Cont'd from page 68

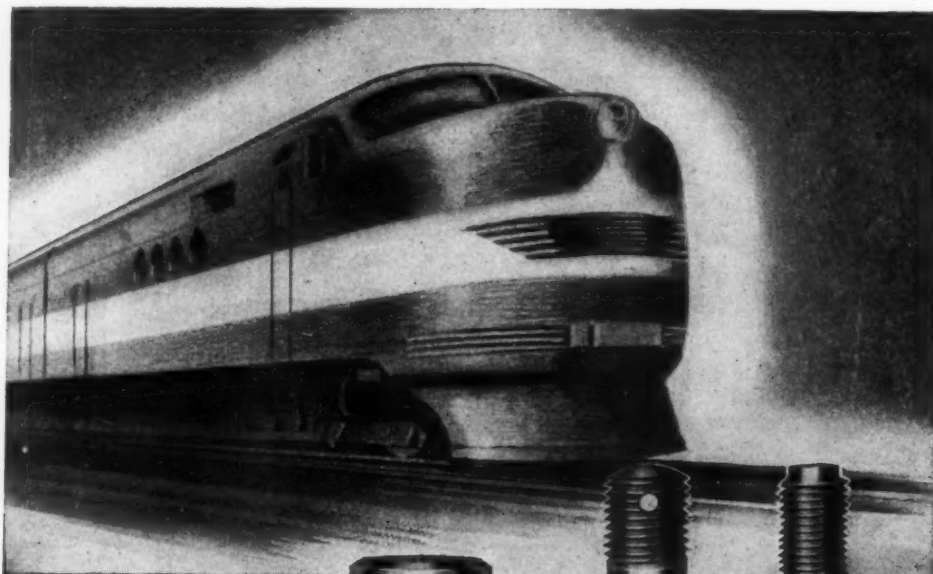
lines—has ordered more of the same . . . in some cases twice as many complete trains as it now operates.

Which should even satisfy the steam engine congenitals.

The air age finds land transport able to give profitable service at 20th century speed levels, and super chief luxury, at 2 cents per mile—

fast subway service, cheap, to the American masses "out West"—beyond the Hudson River, such as it never dreamed possible in the days of 12,000 gallon water tenders and a mere 12 tons of coal, with 30 minute stops for cleaning the ash pans and oiling with a squirt can.

Tomorrow's 60-mile-per-hour freight and 100-mile passenger trains are here today. Away with the sneaky feeling that you mustn't be too enthusiastic, in public, over Diesel motive power.



**SEND YOUR
BOLTING
SPECIFICATIONS
TO A SPECIALIST**

AS A SPECIALIST in the manufacture of distinctive bolting, **ERIE** has manufactured thousands of various bolts, studs and pins. Typical of these are the three pieces shown, which are used in the building of Diesel locomotives.

In view of the special material, heat treatment and close tolerances desired, only a special can meet the rigid requirements of the designer's specifications.

When high quality fasteners are required, together with assurance of lasting economy and top performance, it will pay you to call on **ERIE**. Your inquiries will receive our best attention.

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Editor's Note:

JUST as we close for press we have received the following communication from Mr. Manz, who is now out West:

Butte, Montana

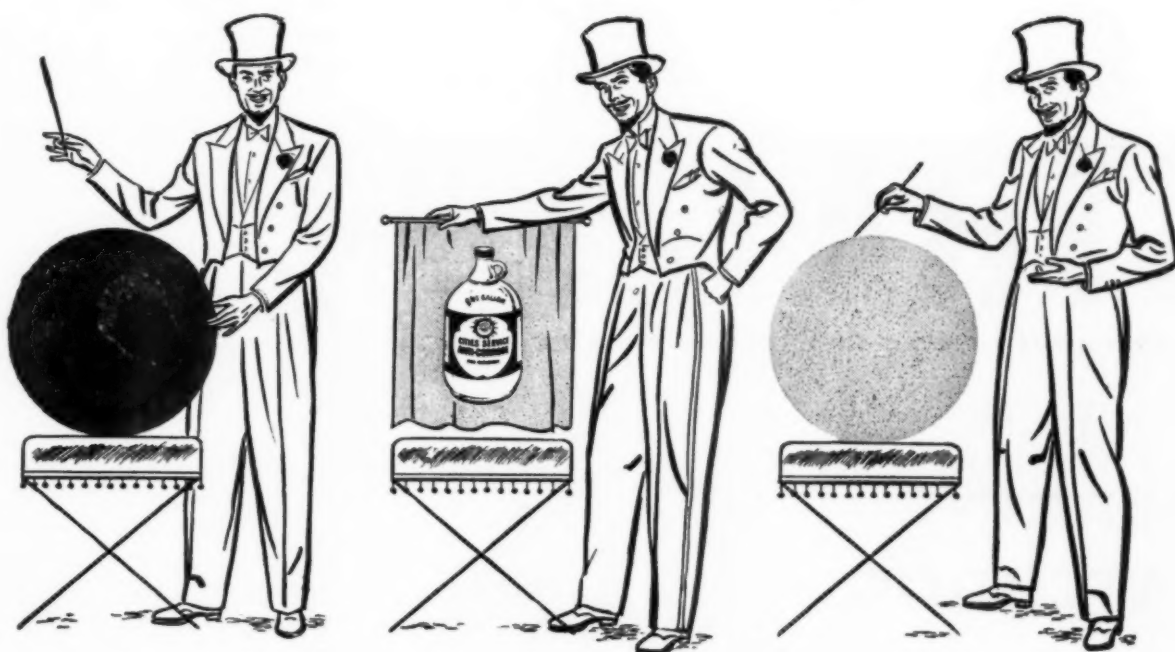
Sunday, Dec. 9, 1945

Dear Boss:

I guess I was too conservative about the 1946 Diesel picture. The nation's longest electrified railroad, the Milwaukee, is not to be caught in a static condition as regards motive power. This huge system, with a record of unique operation of steam, (oil and coal) electric and Diesel, will probably cause jitters among the die hard locomotive people when they start running their streamlined Northwest Hiawatha next summer all the way from Chicago to Tacoma with 3-unit 6,000 hp. General Motors Diesel, not only across their steam sections from Chicago to Harlowton, Mont. but right beneath the 660 miles of trolley on their Montana and Washington electrified zones! Right out of the feedbag, Boss—S'true. This is sound economics too, for it will relieve the pressure on their fleet of electrics and permit modernizing them, after 30 years continuous use, and revamping the entire electrified zones to keep pace with the Age of Diesel. So, Boss, the electric railroad operators are on their toes just the same as the steam people.

Reports have just reached us that the Northern Pacific, 3rd of the trio of Chicago-Pacific Northwest trunk systems, has let the kitty out of the box on what it intends to do in 1946 with its name passenger service between Chicago and Seattle-Tacoma. The N.P. has ordered in 3-unit General Motors 4500 hp. combination freight-passenger Diesels; 24 pullman-built lightweight sleeping cars; 12 baggage cars and 1 diners, in addition to the 30 de-luxe day coaches ordered last Summer. This adds up to the answer for the dear old N.P. for 1946, and it ends coal fired steam power on the fast passenger service of the West's biggest owner of cheapest locomotive coal. The above pair of equipment orders refine down into six completely new lightweight, streamlined North Coast Limiteds. Each will have 5 day coaches, 1 diner, 4 room pullmans, 2 baggage cars and one 4500 hp. Diesel locomotive. Probably a fancy club-observation car will be added later to the consist before the dear old press splashes the May, 1946 headlines: "N.P. streamlines the North Coast Limited, oldest West Coast 'Name' train, etc!"

Now you see it - Now you don't



What you see is a close-up of rust formation, Industry's \$100,000,000 annual toll. What you *don't* see is its quick elimination with CITIES SERVICE RUST REMOVER.

Converting your rust liability into profit isn't magic . . . it's made possible by Cities Service Rust Remover—an effective product—proved in scores of industrial plants. Easy to apply—inexpensive—can be used over and

over again with little waste.

Once you have cleared your machined parts of rust, the next step is to protect them against further rusting. Then you will want one of the Cities Service Anti-Corrodes to provide an impenetrable film that really protects. One of our Lubrication Engineers will be glad to help you select the right one. Write, wire or phone our nearest office or . . .

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Room 583 70 Pine Street, New York 5, N. Y.
Gentlemen: Please send me full information on Cities Service Rust Prevention Plan.
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**MAIL THIS COUPON
TODAY**



Supervising, Continued from page 64
additional equipment and maintenance expense. Another item to be considered in purifying oil with the type of purifier as shown in the cut, is that of the base. Fuels derived from Naphthenic base will filter easier than those derived from paraffinic base, since the wax separates and solidifies unless the fuel goes through a dewaxing process which is not in line with economy and saving.

Then there is the point of the lubricating qualities of fuels which should be considered. Some fuels have better lubricating qualities than others, the lubricating qualities being in a varying degree. Fuels derived from Naphthenic bases and those derived from paraffinic bases both have advantages and disadvantages. The paraffinic base fuels have better ignition qualities, while naphthenic base fuels are more fluid at a given low temperature. Therefore a blended

fuel containing the characteristics of both is desirable.

In any event the selection of fuel is of great importance when considering operating costs, since the qualities of the fuel reach far beyond just the matter of ignition and firing, and one does not gain anything by buying a cheap fuel, because it is cheap, if that fuel contains qualities that increase his operating costs through increased maintenance of purification equipment, fuel handling equipment, pumps, atomizers, rings, liners and pistons. The main thing to be remembered in securing your fuel is to get one which is the most economical from the standpoint of efficiency with a minimum of maintenance cost to the unit from the effect of that fuel upon the various engine parts.

Exchange Ideas, Continued from page 64

and the sleeve on a loose fit, and at the same time enables an old shaft sleeve to be more easily removed when the necessity arises. If some such lubricant is not used, oftentimes the shaft sleeves will adhere to the shaft due to moisture getting between the sleeve and the shaft and rusting on. When this occurs the shaft sleeve can be easily removed by cutting a groove lengthways of the sleeve with a small diamond point chisel. However this should not be necessary if a good lubricant is used, when the sleeve is installed.

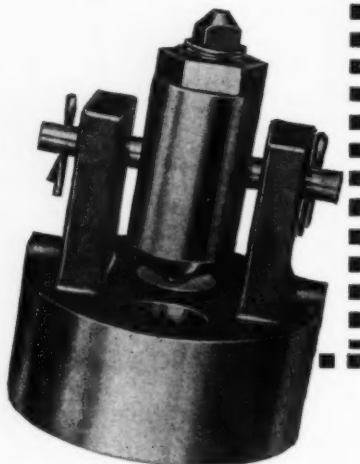
The foregoing points should be kept in mind when servicing and maintaining centrifugal pumps, and should especially be noted, when working on smaller units where the motors are of small horsepower rating, with little reserve power to handle overloads.

The Briggs Filtration Company Acquires Briggs Clarifier

THE engineering and manufacturing enterprise founded in 1933 by Chase Donaldson and S. W. Briggs as the Briggs Clarifier Company took its final peace-time form on December 1, when the business was acquired by The Briggs Filtration Company, a Maryland corporation. The officers of the new company, all of whom served with the old company, are Chase Donaldson, president; S. W. Briggs, vice president; R. C. Zschiegner, treasurer; W. E. Furey, secretary-counsel; Cecil Hopkins, assistant secretary. The directors are Chase Donaldson, president; S. W. Briggs, vice president; Richard P. Dunn, partner, Auchincloss, Park & Redpath; Bradley J. Gaylord, vice president, The Pennroad Corporation, Wilmington, Delaware; Clark W. McKnight, Wilmington, Delaware. Nearly all of the personnel of the old company have been retained.

EXTRA Protection for Diesel Engines

WITH THE BEARING WATCHDOG SYSTEM



The Bearing Watchdog trip lever literally "measures" the wear of Diesel bearings. With the Bearing Watchdog System installed in an engine (one Watchdog below each connecting rod throw) wear beyond predetermined standard, or shell-out of connecting rod and main bearings can be detected in plenty of time to prevent damage to the crankshaft. The Bearing Watchdog System is one proved, effective way to cut Diesel maintenance costs. It will save you thousands of dollars and the loss of many hours operating time for your Diesel equipment.

- ★ Cuts Diesel Maintenance Costs
- ★ Protects the Crankshaft
- ★ Permits Maximum Bearing Wear
- ★ Reduces Need for Frequent Bearing Inspection
- ★ Locates Faulty Bearing Instantly
- ★ Simple . . . Positive . . . Has Low Maintenance Factor
- ★ Can be Operated Either Pneumatically or Hydraulically
- ★ Protects the Engine

We invite inquiries from Diesel Designing Engineers, Diesel Engine Manufacturers, and Diesel Operators. Write today for detailed information.



PAXTON
DIESEL ENGINEERING COMPANY
OMAHA 5, NEBRASKA

Curtiss-Wright Acquires Marquette Metal Products Co.

CURTISS-WRIGHT Corporation has acquired the Marquette Metal Products Company, G. W. Vaughan, president of Curtiss-Wright, and Herbert Gleitz, president and general manager of Marquette, recently announced in a joint statement. Mr. Gleitz will continue as president and general manager of the Marquette firm and Mr. Vaughan will assume the newly-created position of chairman of the board, the announcement said.



Herbert Gleitz

The Marquette firm is the second company Curtiss-Wright has acquired during the past year, marking a definite trend for the corporation in taking over comparatively small manufacturing units where engineering and financial assistance can be used to advantage. Late in 1944, Curtiss-Wright purchased the L. G. S. Spring Clutch Corporation of Indianapolis, manufacturers of spring clutch assemblies for all types of mechanical equipment. The Marquette company currently employs 1000 people at its Cleveland plants where operations will be continued. No change in personnel is contemplated under the new set-up with the exception noted above.

New Bulletin on Motors and Generators

CENTURY Electric Company has announced a new bulletin covering its line of motors and generators. Featured in this bulletin are AC motors of various starting characteristics ranging from fractional hp. to 600 hp., also a full line of DC motors with a wide range of mountings and enclosures. Gear motors in lower hp. brackets are also described and illustrated. The generator line includes both AC and DC types as well as MG sets all of which are drip proof and many have splash proof enclosures. Com-

plete data are tabulated for quick, easy reference and all motor and generator types are illustrated. A copy of this useful bulletin will be mailed on request to Century Electric Company, 1806 Pine Street, St. Louis 3, Missouri. Just ask for the Century Motor and Generator Bulletin.

H. J. Ritter Returns To Norma-Hoffmann as President

AT a meeting of the Board of Directors of the Norma-Hoffmann Bearings Corporation held

on December 7th, 1945, Harold J. Ritter was elected President and Treasurer and a member of the Board of Directors of the corporation, succeeding O. P. Wilson who had resigned.

Prior to his resignation from the Norma-Hoffmann Bearings Corporation, which became effective June 30th, 1944, Mr. Ritter was with the company for 28 years, having held many company posts including that of Sales Manager, Assistant Secretary, Secretary, Vice-President and Director.

FUEL POWER

for Production

Means

[B] FULLER POWER FOR PEACE [B]

For 85 years — as the world's oldest refiner — the makers of famous Be Square products have assisted in the development of many significant changes and improvements in the refining and manufacture of petroleum lubricants.

While furnishing high standard lubricants to our Armed Forces, Be Square perfected many new processes and manufacturing techniques to give the production of peacetime America finer, more efficient Diesel lubricants.

BE SQUARE HEAVY DUTY DIESEL ENGINE OILS

FULL Diesel power means MAXIMUM KILOWATT HOURS AT MINIMUM MAINTENANCE COST. For your Diesels to maintain such operating records, specify BE SQUARE HEAVY DUTY DIESEL ENGINE OILS — manufactured with IMPROVED ADDITIVES to resist ring-sticking, sludge, corrosion, scuffing and hard-carbon deposits.

Be Square lubricants are tested under high temperature operating conditions which determine their OXIDATION STABILITY, CORROSION CHARACTERISTICS, and OVER-ALL LUBRICATING VALUES. Many satisfied customers testify to the extra margin of protection assured by BE SQUARE DIESEL LUBRICANTS.

"BE SQUARE TO YOUR ENGINE"

Consultation Service—
Our experienced engineering services are available to your plant management without cost or obligation.

BARECO

BOX 2009

Barnsdall, Okla.

OIL CO.

TULSA, OKLA.

— refineries — Wichita, Kansas

Burlington Lines Extends Diesel Passenger Service

COMPLETE "Dieselization" of Burlington passenger train service between Chicago, Omaha and Denver, as well as the assignment of Diesel locomotives to several other important passenger runs, was just announced by Vice President H. C. Murphy.

"This important achievement has been made possible," Mr. Murphy said, "by the delivery within the past few weeks of ten new 4000

horsepower Diesel locomotives and the pooling of these with five similar locomotives acquired before the war. Including its Zephyrs, the Burlington Lines, which introduced Diesel passenger service on American Railroads in 1934, now has 27 Diesel passenger locomotives, one of the largest Diesel passenger fleets in the world.

"The inauguration of these ten additional Diesel locomotives will insure improved on-time performance with present heavy trains and probably will permit some schedule reductions

when traffic conditions return to normal."

Effective at once, the following Burlington trains, in addition to the Zephyrs, will be regularly Dieselized:

Nos. 39-40—Exposition Flyer between Chicago and Denver; Nos. 5-30—Ak-Sar-Ben between Chicago and Omaha; No. 11—Advance Flyer from Chicago to Lincoln; Nos. 15-8—Fast Mail between Chicago and Lincoln; Nos. 7-3 and 12 between Chicago and Denver; Nos. 55-56—American Royal between Chicago and Kansas City; No. 9—Chicago to Galesburg; No. 6—Omaha to Chicago; Nos. 43-43—between Lincoln and Ravenna, Neb.

The new 4000 hp. General Motors Diesels are the first passenger locomotives the Burlington has been able to obtain since before the war.

Evans Products Acquires New Plant

A NEW plant, nearly three times as large as its present Detroit plant, has just been acquired by Evans Products Company. The additional manufacturing space has been made necessary by the increasing peacetime requirements of Evans customers. Evans' thermo-control fan, which automatically controls the water temperature of all types of internal combustion engines, by means of adjustable pitch blades, will soon be produced in Evans' recently purchased plant at Plymouth, Michigan. Situated only a few miles from the Detroit city limits, Evans Products Company is rapidly converting the government-built war plant to large-scale peacetime production.

New Quadruplicate Screw Pump Announced

QUIMBY Pump Co., a division of H. K. Porter Company, Inc., announces new developments in its balanced quadruplicate screw pump. Improvements are demonstrated by the new external bearing pump designed with bracket type anti-friction thrust and line bearings. Separate pedestals with the three-point alignment problem and spacing washers are eliminated, providing free expansion of shafts for wide changes in temperatures. Precision pre-loaded anti-friction bearings permit close running clearance between the body bores and the screws.

The Quimby screw pump, the first positive displacement pump developed in America, has been progressively refined since its introduction in 1894. Designed for pumping various viscous liquids such as Bunker C fuel oil, tar, rayon dope, molasses, soap liquids, etc., it is also used in handling thin liquids such as water, alcohol, and commercial solvents of various types.

it takes a
CLEAN ENGINE
to deliver
FULL POWER

TO CLEAN OUT
THE ENGINE



All manufacturers' performance ratings are based on clean engines. A dirty engine cannot produce the power built into it because sludge, gum and acid accumulations create abnormal conditions and "foul up" working parts.

LOOSITE, a basic cleaner, rids the engine of all sludge and gum. It reaches valves, rings and pistons; restores their real efficiency. It is safe, easy and economical to use.

After one LOOSITE treatment, a can of SILOO added with each change of crankcase oil, keeps your engine clean by dissolving immediately any new sludge formations. SILOO, the seven-solvent compound with four inhibitors, becomes an integral part of the lubricant itself—cannot be removed by any standard filter. This is important.

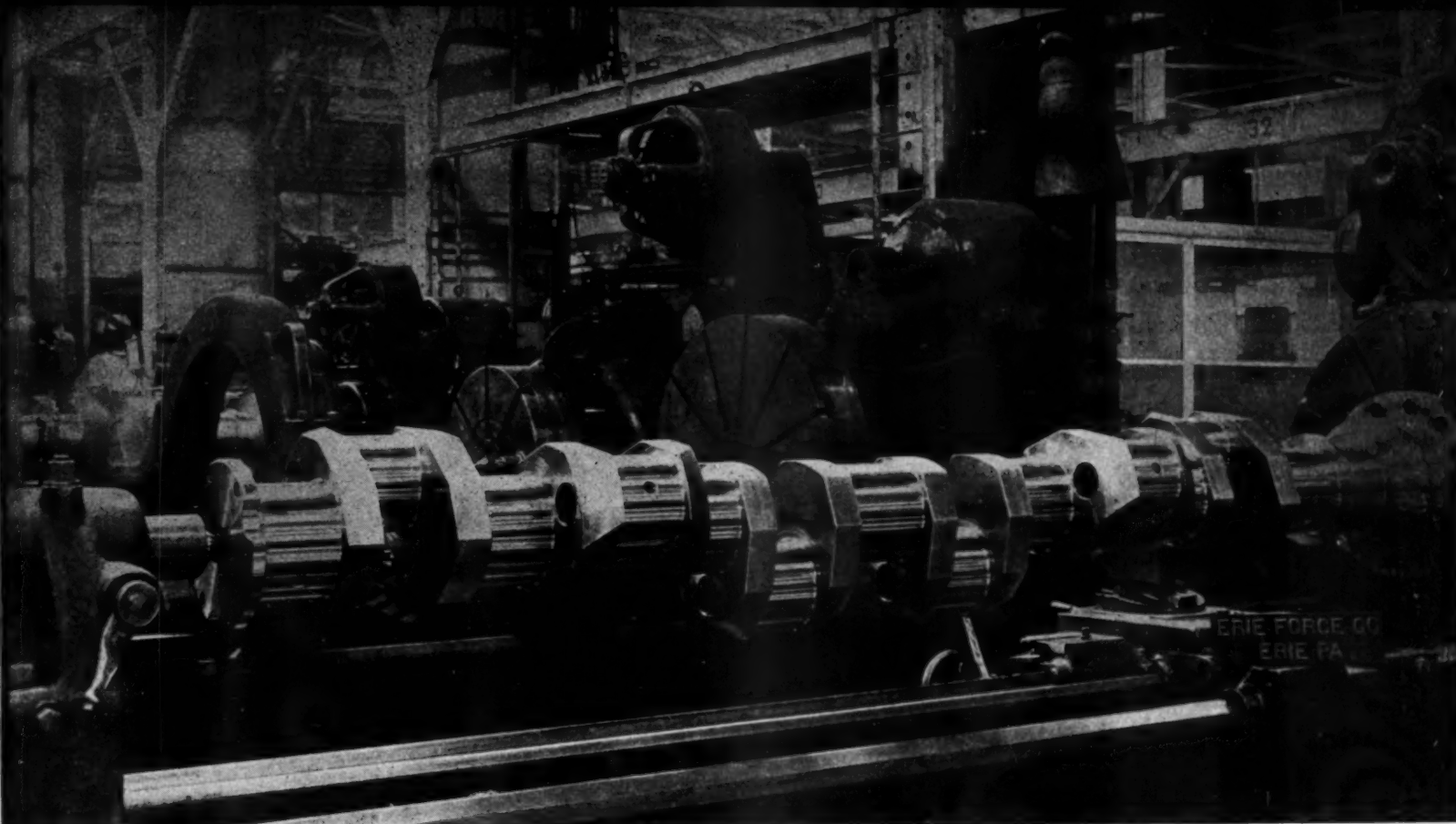
A LOOSITE-SILOO treatment will show immediate results on any type Diesel or gas engine. Fifteen years of service to Diesel experts endorse its use.

SOLENTS FOR ALL TYPES OF PETROLEUM RESIDUES
Petroleum Solvents
CORPORATION

General Offices: 331 Madison Avenue, New York 17, N.Y.
Plant and Laboratories: Port Reading, New Jersey

Petroleum Solvents Corp., of Canada, Ltd.,
Dominion Square Bldg., Montreal

If you heat with oil—
write for information
on SILOO FUEL OIL
TANK SOLVENT

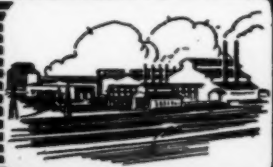


Finished crankshaft for an
Alco, six-cylinder Diesel.

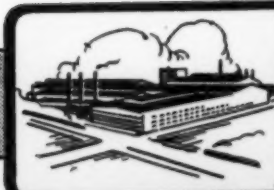
SHAFTING

**for
AMERICA'S
DIESELS**

From start to finish, the manufacture of Diesel shafting in Erie Forge shops remains under constant control of one responsible, experienced organization. That is positive assurance of excellence in material and workmanship — that is the reason Erie Forge shafting is specified for America's Diesels.



ERIE FORGE COMPANY, ERIE, PA.



National Supply—Host

IN cooperation with the Diesel Engine Manufacturers Association, the Superior Engine Division of the National Supply Company was host on November 23 to a representative group of college professors who are responsible for engineering and internal combustion engine instruction in colleges of Ohio, Indiana, West Virginia, Kentucky, and Tennessee.

The meeting was in furtherance of an established policy of both Superior and the D.E.M.A. to promote, in every way possible, a better understanding of the problems encountered in the construction and operation of the Diesel engine and an increased appreciation of the infinite variety of its application in the production of economical dependable power.

The D.E.M.A. was represented by its Executive Director, Harvey T. Hill of Chicago, who was one of the speakers on the program.

The program was as follows:

MORNING SESSION

INTRODUCTORY REMARKS

Harvey T. Hill, Executive Director, D.E.M.A.

WELCOME TO THE PLANT

Robert M. Pearson, Manager of Sales

HISTORY OF SUPERIOR IN THE INTER-



Engineering School heads, guests, National Supply and D.E.M.A. officials attending the November 23rd meeting.

NAL COMBUSTION ENGINE FIELD

H. M. Houston, Oil Field Sales

SHOP DEMONSTRATION OF SUPERIOR ENGINES — TRIP THROUGH THE RESEARCH LABORATORY

AFTERNOON SESSION

(Speakers introduced by Geo. F. Nolte, Chief Engineer)

"SUPERIOR DUAL FUEL ENGINE"

Harold F. Shepherd, Chief of Research Labora-

tory

"DIESEL ENGINE DEVELOPMENT TRENDS"

John Ostborg, Asst. Chief Engineer

"VIBRATION PROBLEMS"

C. W. Areson, Development Engineer

"SPECIAL APPLICATION PROBLEMS"

A. B. Reese, Jr., Asst. Chief Engineer

"FUEL INJECTION PROBLEMS"

H. W. Hanners, Asst. Research Engineer

QUESTIONS AND ROUND TABLE



We taught an old sea-dog new tricks!

The new Mack Mariner Marine Diesel engines are even better than pre-war models—and any user will tell you how good *those* were. They're engineered to give you new peaks of performance, stamina and operating economy . . . combined with the traditional reliability that has been characteristic of Mack engines for 41 years. Quick starting—4-cycle efficiency—60 to 100 h. p., conservatively rated on a continuous duty basis. Direct factory branch service at 28 tidewater and 14 freshwater ports.

Write for information. MACK MANUFACTURING CORPORATION, Marine Engine Dept., Empire State Building, New York 1, N. Y.

Mack DIESEL MARINE POWER

MACK MARINE ENGINES ARE A PRODUCT OF THE BUILDERS OF WORLD-FAMED GASOLINE AND DIESEL-POWERED TRUCKS, BUSES AND FIRE APPARATUS.

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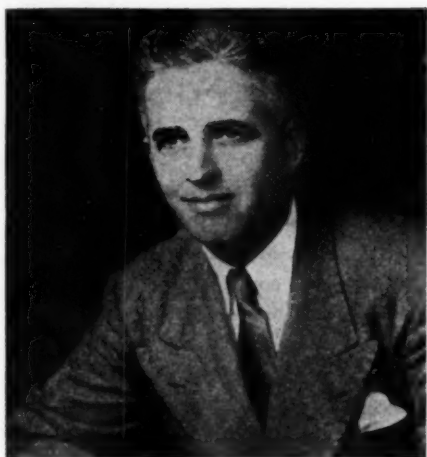
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Another Presidency For Ralph Rogers



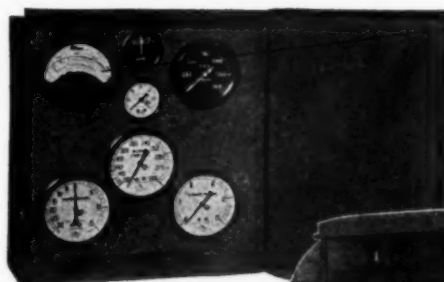
Ralph B. Rogers, of New York, whose election as president and general manager of the Indian Motorcycle Company of Springfield, Mass., was recently announced by the board of directors. Mr. Rogers also is president of the Rogers Diesel and Aircraft Corporation, of New York; the Edwards Company, of Sanford, North Carolina; Hill Diesel Engine Company and the Ideal Power Lawn Mower Company, of Lansing, Michigan, and the Armstrong Rubber Export Corporation, of New York. He is a native of Boston, Massachusetts.

Commercial Iron Issues Brochure

A HIGHLY informative brochure based on "men, methods and machines" has been produced by Commercial Iron Works of Portland, Oregon for the benefit of potential customers not personally acquainted with the company and its facilities. The brochure, prepared by the Short and Baum Advertising Agency of Portland, is a comprehensive study of the pioneer Portland firm, covering every detail of technical or human interest.

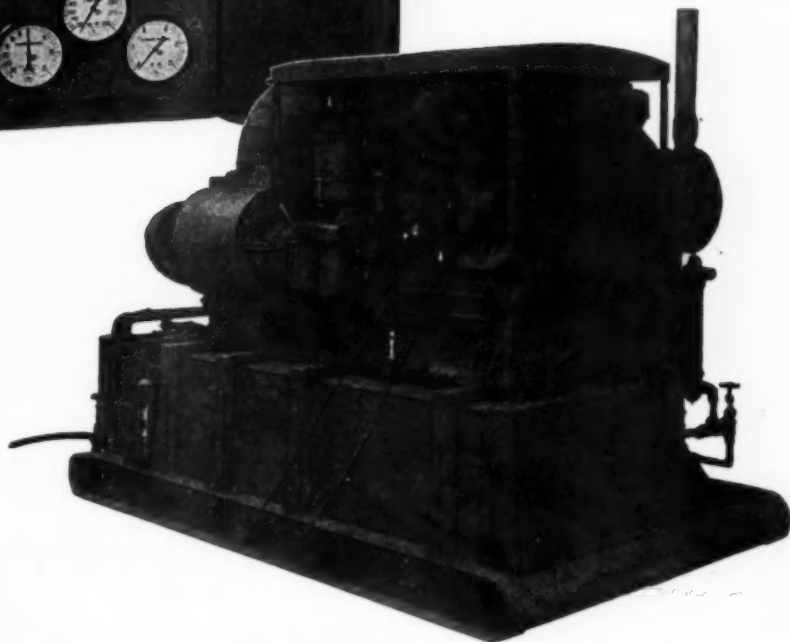
A thumbnail sketch of the company's 30-year history tells of its founding in 1916 as a foundry and machine shop and its expansion into engineering, ship construction and ship repair. The firm's pre-war and war accomplishments are listed—mirroring its reputation for versatility and dependability.

The brochure has "Know How" as its theme, and supports this with a review of a variety of jobs done, ranging from the manufacture of many types of heavy machinery to the construction of giant fighting ships for the United States Navy. The brochure's objective is to show that Commercial, with 30 years of experience and greatly expanded facilities, is ready for almost any type of job. Those interested may secure this brochure upon request to Commercial Iron Works, Union Ave., and Stephens, Portland, Oregon.



Meco 6000 gal. per day Watermaker built by Mechanical Equipment Company, driven by Superior Diesel.

Alnor Exhaust Pyrometer at top left of instrument board.



pure drinking water ... anywhere

The Meco Watermaker, an automatic Diesel driven unit, produces drinking water from ocean brine, or stagnant, swamp, or infested waters. Hundreds of these units serve our armed forces all around the world.

Alnor Exhaust Pyrometers were selected for use with the Diesel engine which powers the Meco Watermaker. These reliable instruments provide a quick, accurate check of exhaust temperatures as a guide to efficient operation and maintenance.

There is an Alnor Pyrometer for every type of engine, large or small, afloat or ashore. Write for Exhaust Pyrometer bulletin describing the complete line.

Illinois Testing Laboratories, Inc. 420 North LaSalle Street, Chicago 10, Illinois.

Alnor Exhaust Pyrometers

Alco Reports Locomotive Sales

UNFILLED steam and Diesel locomotive orders for overseas export by American Locomotive Company now total 558 units, it was recently reported by D. W. Fraser, president. This figure includes 160 locomotives just placed with the company for France:

Up to Nov. 30, the company had built and shipped 421 locomotives for service abroad. For the current year units already shipped and those on order for the export trade were listed as

follows: France, 420; India, 176; Belgium, 240; Portugal, 22; Brazil, 85; Mexico, 22; Cuba, 10; Jamaica, 3; Honduras, 1. In addition to these, the company so far this year has delivered 528 locomotives to the War Department (of which 421 were assigned to Russia before lend-lease was canceled.

Indicative of increased use of Diesel-electrics in Central and South America are orders placed by Central Railroad of Brazil for thirty-four 100 horsepower American Locomotive-General Elec-

tric units and orders for 6 more placed by the Mexican Government Railways. The latter order adds to the present Mexican Diesel fleet which was built by the company last year. Most of the Brazilian Diesels have been shipped.

General Electric Consolidates Its Federal and Marine Divisions

THE Navy Ship, Merchant Ship, and Diesel-Electric Divisions, now a part of General Electric's Federal and Marine Divisions, have been consolidated into a new Marine Division, effective November 1, according to an announcement by R. S. Neblett, Manager of the company's Federal and Marine Divisions. Simultaneously, Mr. Neblett announced the appointments of E. K. Henley as Manager, and W. H. Wild as Manager Sales, of the new Marine Division. "This centralization of all shipbuilding activities is expected to provide better service," Mr. Neblett said.



E. K. Henley

W. H. Wild

Mr. Henley, born in Norfolk, Va., was graduated from Virginia Polytechnic Institute in 1912 with a B.S. degree in mechanical engineering. He joined General Electric Test in 1916, leaving there in 1917 for World War I. He returned in 1919 to be placed in the turbine engineering division. In January, 1920 he became a proposition engineer in the marine engineering division, which combined with the Marine Sales Department to form the Federal and Marine Department in January, 1926. And in 1943 he was made manager of the Merchant Ship division.

Mr. Wild was born in Seward, N. Y., and in 1912 he was graduated from Syracuse University as an electrical engineer. In July of that year he came to General Electric Test, transferring to the engineering section of the railway supply department in 1913. In 1918 he was assigned to the marine engineering department, and in 1943 he was appointed manager of the Diesel-Electric Division.

MARINE BUCKEYE STATIONARY DIESELS



IT'S TIME NOW

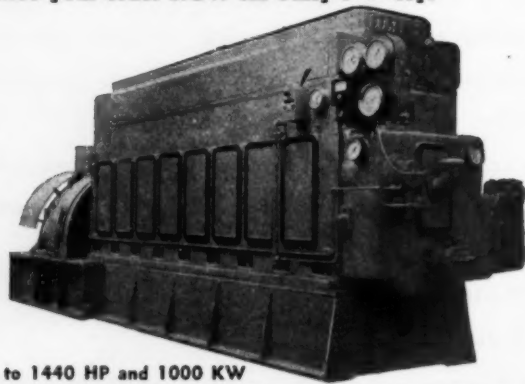
To decide on your New Diesel Engines

Buckeye Diesels are Engineered for Dependability, Economical Operation and Long Life

- Buckeye heavy-duty crankshafts are solid forgings of special steel which resists fatigue and crystallization.
- Buckeye cylinder liners are made of close-grained, extra hard nickel chromium alloy, and are water-cooled over their entire surface. These features have more than doubled the life of the liners.
- Reversible, shell-type, silver-alloy bearings — manufactured by a special Buckeye-developed process—will last, with proper care, for the life of the engine.

There are other major features that help produce dependable power at lower cost for Buckeye owners. Write for your Buckeye bulletins. Place your order NOW for early delivery.

Stationary and
Marine Propulsion
(Direct Reversing)
Engines
150-900 H.P.



Marine Auxiliary
and Stationary
Generator Sets
100-600 KW

*Supercharged Ratings to 1440 HP and 1000 KW

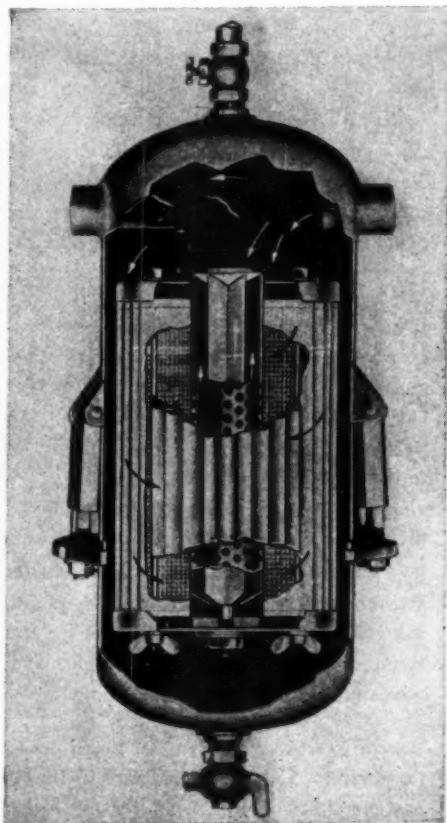
"Be Profit-Wise and Dieselize with Buckeyes"

THE BUCKEYE MACHINE CO., LIMA, OHIO

• ENGINE BUILDERS SINCE 1908 •

New Liquid Filter Provides Quick Change of Medium

THE recently announced Staynew Model ELS filter features an entirely new design of filter insert. Insert assembly consists of inner and outer radial finned forms of wire cloth. The outer form, on which the filtering medium is crimped, slips over the inner form. Top and bottom plates and seal gaskets are then applied and the whole assembly held in place by through bolts.



The new type insert, known as the *Slip-On*, permits the use of practically any type of filtering medium obtainable in sheet form that can be crimped. It also permits quick change or replacement of filtering medium in the field. Spare insert outer forms are relatively inexpensive and may be stocked in a variety of media ready for instant change or replacement. Thus the Staynew Model ELS filter is the most versatile liquid filter ever developed, with a broad range of applications throughout industry. Inquiries should be sent to: J. S. Zahniser, Sales Manager, Dollinger Corp., Rochester 3, N. Y.

Ajax Appoints Chicago Representative

THE Ajax Flexible Coupling Co., Inc., Westfield, New York, announces the appointment of R. R. Bauman as its Chicago area Sales Representative. Mr. Bauman's address is 407 South Dearborn Street, Chicago.

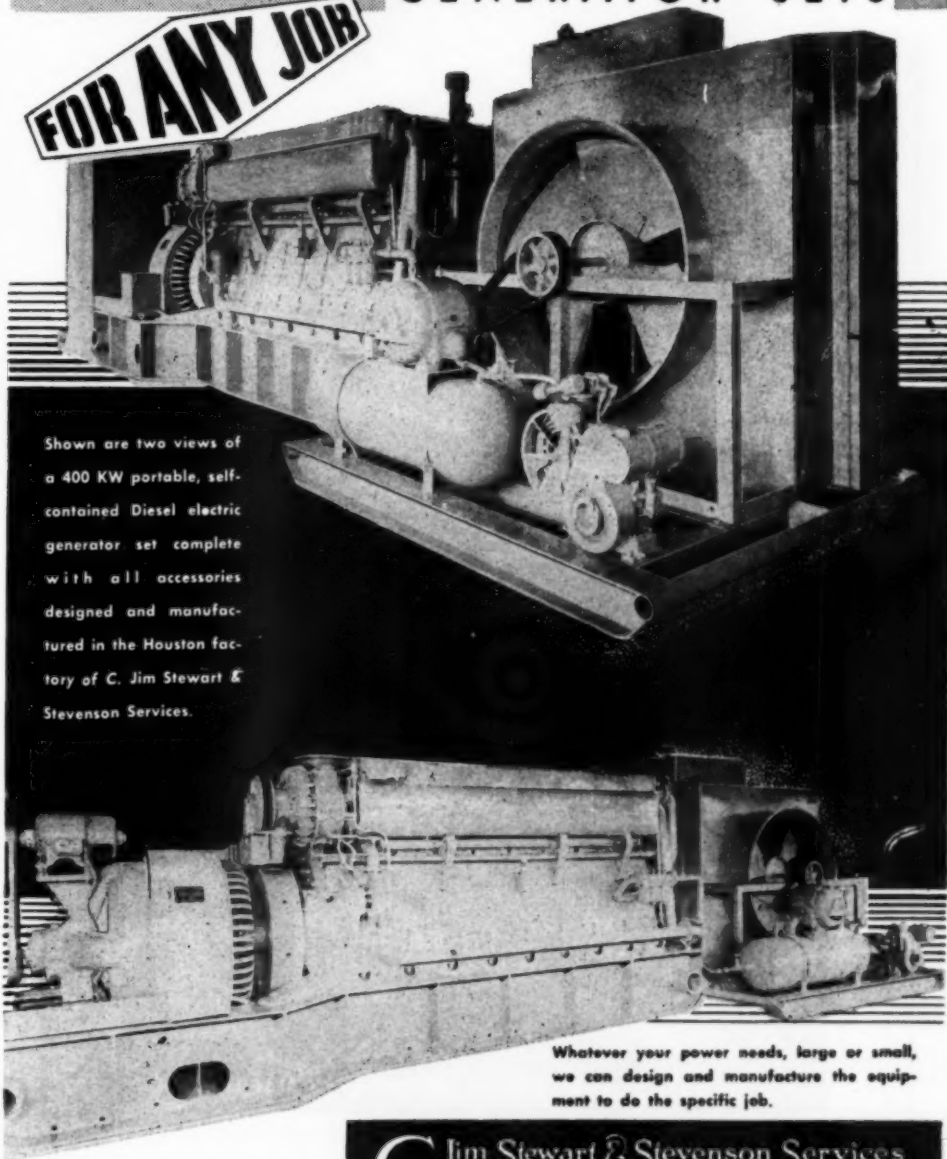
Commander Gellhorn Returns to Worthington

COMMANDER George Gellhorn, who left Worthington Pump and Machinery Corporation on January 1, 1942 for active duty in the U. S. Navy, has been released to inactive status and has returned to resume his position as Export Manager with offices at Worthington's Harrison Works. During his term of duty, he was Assistant Naval Attache in Buenos Aires, Executive Officer at the U. S. Naval Base in

Bahia, Brazil, Executive Officer aboard the U. S. S. Albermarle and Navigating Officer of the U. S. S. Gambier Bay, which was sunk by enemy fire during the Battle for Leyte Gulf. In this latter encounter, Mr. Gellhorn was rescued by another United States warship after being in the water for 45 hours. Before receiving his orders to report for active duty, Mr. Gellhorn had been in the service of Worthington Pump and Machinery Corporation for over eleven years.

COMPLETE PORTABLE DIESEL ELECTRIC GENERATOR SETS

FOR ANY JOB



Shown are two views of a 400 KW portable, self-contained Diesel electric generator set complete with all accessories designed and manufactured in the Houston factory of C. Jim Stewart & Stevenson Services.

Whatever your power needs, large or small, we can design and manufacture the equipment to do the specific job.

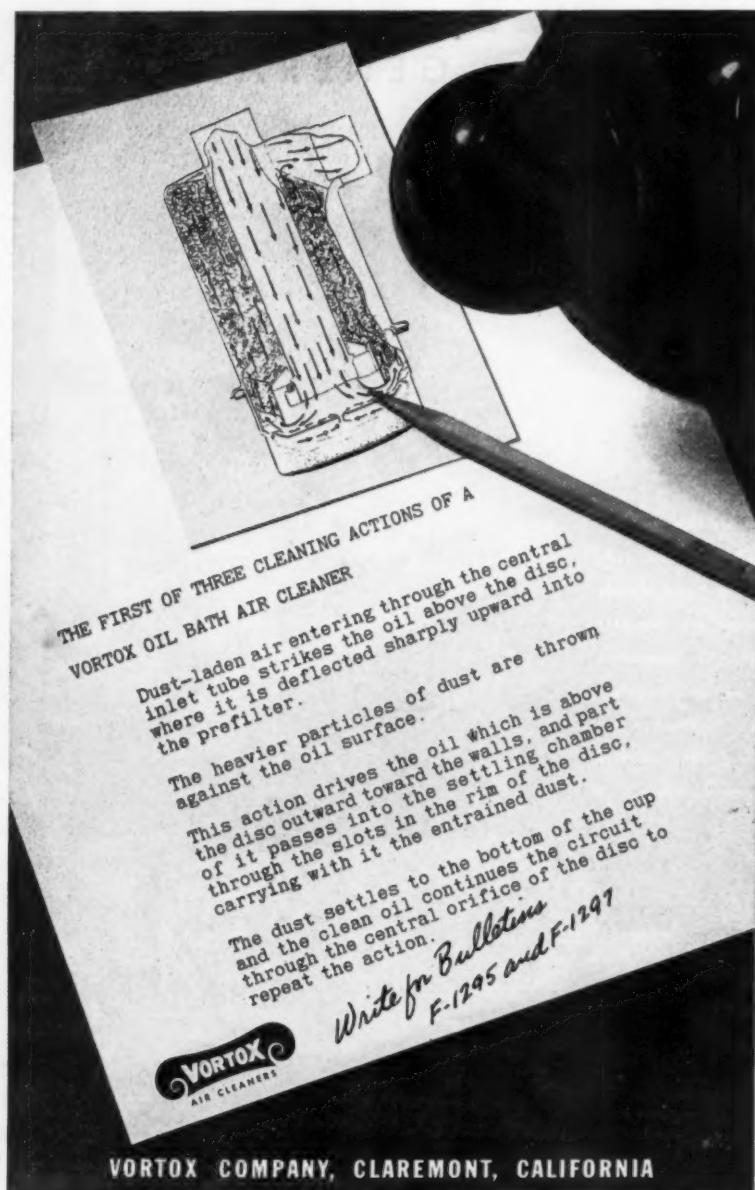
C. Jim Stewart & Stevenson Services
Distributors of
G. M. DIESEL and RED SEAL CONTINENTAL ENGINES
4516 HARRISBURG BOULEVARD, HOUSTON 3, TEXAS

Anywhere SERVICE - PARTS Anytime

Future of American Merchant Fleet Discussed in New Booklet

THE importance of the Merchant Marine to the future security and economic welfare of America is discussed in a new booklet announced by the Westinghouse Electric Corporation. After reviewing the varied history of our Merchant Fleet, the new 30-page illustrated booklet states the problems to be faced: we must decide how big a merchant fleet is consistent with sound national policy; we must decide how these ships will be employed in peace-

time; and we must decide what to do with our "surplus" fleet—the Liberty Ships—and whether or not we should keep all our efficient ships—the Victories, tankers, and C-type cargo ships. The U. S. Merchant Marine is a national asset of first importance, according to the booklet, and the various problems connected with it deserve the serious consideration of every citizen. Copies of the booklet (B-3539), "This Time Let's Keep Our Merchant Marine," may be secured from the Westinghouse Electric Corporation, Box 868, Pittsburgh, Pa.



National Aircraft Show

GENE P. ROBERS has been appointed Vice President in Charge of Publicity and Promotion of the National Aircraft Show to be held in Cleveland, Ohio, January 11 to 20, 1946. Robers is Sales Promotion Manager of the Weatherhead Company and has been given a ninety-day leave of absence by his company to head up the promotion of the huge aircraft show. The National Aircraft Show will attract national attention, being the first such show since 1939.

"This will be the largest aircraft show in history. With the endorsement and cooperation of General H. H. Arnold and the Army Air Forces, this show will portray to the public and aviation industry of the nation, all of the war weapons and equipment plus all of the new planes and equipment for the coming air age," Robers said.

Extensive equipment of the Army Air Forces at Wright Field will be on exhibition as well as captured equipment from all theatres of war. Complete facilities of the large Public Auditorium at Cleveland will be taxed to capacity to house all of the exhibits.

D.E.M.A. Elects Officers

E. J. SCHWANHAUSSER, Vice-President of Worthington Pump & Machinery Corporation, was elected President of Diesel Engine Manufacturers Association at the association's annual meeting, held December 11 in Chicago.

Gordon Lefebvre, President of Cooper-Bessemer Corporation, and J. E. Peterson, Vice-President of General Machinery Corporation, were elected Vice-Presidents of the association.

Reelected as Treasurer was Robert H. Morse, Jr., Vice-President and General Sales Manager of Fairbanks, Morse & Co.

Harvey T. Hill, Executive Director of Diesel Engine Manufacturers Association, was likewise reelected to serve through 1946.

New Directors who were elected are A. W. McKinney, Vice-President of National Supply Co.; G. F. Twist, Vice-President and General Manager of Atlas Imperial Diesel Engine Company. Continuing on the Board of Directors are George W. Codrington, Vice-President of General Motors Corporation; Charles E. Brinley, Chairman of the Board, Baldwin Locomotive Works; Robert E. Friend, President of Nordberg Mfg. Co.; Norris H. Schwenk, President of Busch-Sulzer Bros.-Diesel Engine Co.; Mr. Schwanhausser, Mr. Morse and Mr. Lefebvre.

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Westinghouse Marine, Aviation Sales Departments Combine

J. H. JEWELL, manager of the Industry Sales Departments of the Westinghouse Electric Corporation, has announced the transfer of the Aviation Section activities from the Industrial Sales Department to the Marine Sales Department headed by C. H. Weaver. This department now will be known as the Marine & Aviation Sales Department of the company. At the same time, Mr. Weaver announced the appointment of A. L. Paquette as manager of the Aviation Section of the department.



C. H. Weaver

Mr. Weaver, a native of Philadelphia, entered the graduate student course of Westinghouse immediately after his graduation from the University of Pennsylvania and for four years worked in the Generator Sales Department. In February, 1940, he was transferred to the Marine Section of the Industrial Department and in October, 1943, was made manager of the newly formed Marine Department.

L. C. Goad Becomes General Motors Vice President

THE appointment of L. C. Goad, vice president, as a group executive in charge of the General Motors divisions at Dayton, Ohio—Frigidaire, Delco Products, Moraine Products, Aeroproducts and Inland Manufacturing; the Delco Appliance Division at Rochester, N. Y., and also the Buick-Oldsmobile-Pontiac Assembly Division with plants at Linden, N. J., and Southgate, Calif., and contemplated plants at Atlanta, Ga., Framingham, Mass., Kansas City, Mo., and Wilmington, Del., was recently announced by C. E. Wilson, president of G.M.

Mr. Goad joined the Delco-Remy Co. at Anderson, Ind., in 1923. He transferred to the AC Spark Plug Division in 1933, becoming general

manager in 1938. After several assignments in Detroit, he was appointed general manager of the Eastern Aircraft Division in 1942 and elected a vice president of General Motors in 1943. He is a member of the Administration Committee of General Motors.

Elliott Appoints Bingham H. Van Dyke

THE appointment of Bingham H. Van Dyke as manager of the New Products Department

has been announced by the Elliott Company. Previously assistant to the director of Research and Development, Van Dyke came to the Elliott Company from the War Production Board where he was deputy chief of the Heat Exchanger and Pressure Vessel Branch. Educated at Cornell University and the University of Pennsylvania, he was graduated from the latter in 1933 in chemical engineering. After graduation he was with the Atlantic Refining Company and The Griscom-Russel Company.

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is toward
**CHICAGO
SCREW**
... for Precision Screw Machine Products
— any shape — any quantity
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To your most Exacting Specifications
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1026 S. Homan Ave. Chicago 24, Ill.

NOW RELEASED FOR COMMERCIAL USE . . .

"FIXED-READING"
PREMAX MODEL YRF
ENGINE PRESSURE INDICATOR

RANGE
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for **DIRECT-READING**
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FIRING PRESSURES
 OF EVERY TYPE OF DIESEL ENGINE
 . . . at any engine speed
 and rate of pressure rise.

Send coupon for detail description of design and operation and a 20-page booklet telling how others use the PREMAX for protective Diesel maintenance.

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 7000 BENNETT STREET, PITTSBURGH, PA.

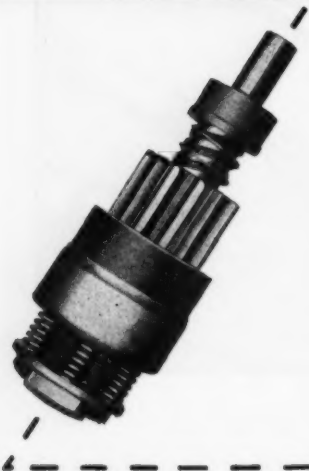
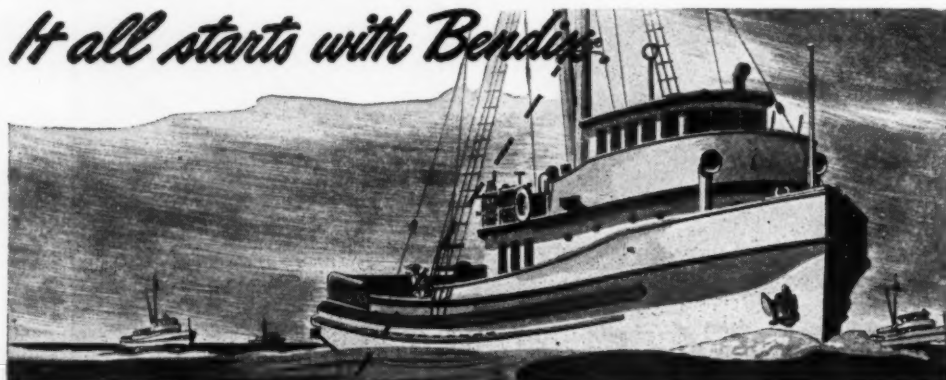
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Out of touch with land for months at a time, Diesel-powered commercial fishing craft must be "dead sure" of continuous dependable starting.

—and Bendix® Starter Drives provide just that.

Designed and engineered for compactness, ruggedness, universal adaptability, and simplicity of operation, these heavy-duty Drives have a performance-proven record of many years of dependable service on land and sea.

For heavy-duty Starting—marine, automotive and industrial—Bendix is best.

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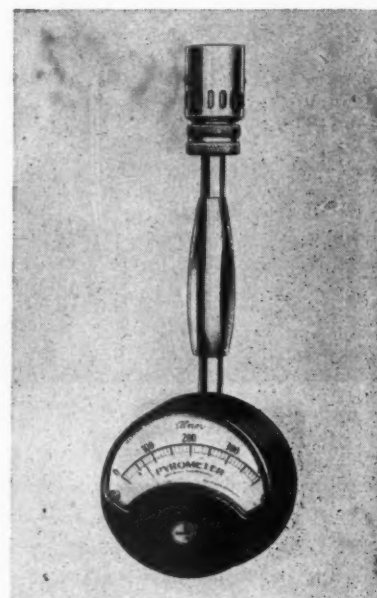
Bendix Drive

ECLIPSE MACHINE DIVISION
 ELMIRA, NEW YORK

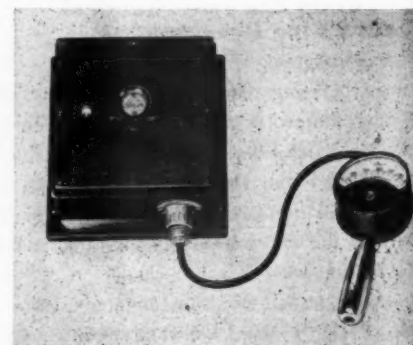


Alnor Portable Pyrometer For Severe Conditions

A SPECIAL combination of portable Alnor pyrometer and thermocouples permanently installed in the heat zones provides temperature measurement readings under severe operating conditions where a permanently installed instrument would be inadvisable. Excessive vibration, dust and dirt, fumes, lack of space, and similar conditions would affect pyrometer performance if the instrument were continuously subjected to these severe operating conditions. This new Alnor portable pyrometer is not subjected to the adverse influences except at relatively short intervals as periodic temperature readings are taken.



Alnor Portable Pyrometer with rigid handle and attachment plug. When plugged into the receptacle both hands are free to manipulate the switch and record temperatures.



Alnor Type T Multi-point selector switch, permanently wired to thermocouples in heat zones. Switch case has receptacle for attachment of portable Alnor Pyrometer for periodic temperature readings.

The Alnor portable pyrometer is a hand-held instrument, available in a choice of several ranges, and equipped with a bayonet type attachment plug at the end of the handle. The

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operator plugs the pyrometer into the receptacle box, which is connected permanently to the thermocouple.

Another type of installation with several thermocouples in heat zones can be wired to an Alnor Type T selector switch, allowing readings to be taken from successive locations by turning the switch knob. The Alnor portable pyrometer is plugged into the switch case receptacle. This new pyrometer equipment is especially adapted to portable engine installations, and many uses in industrial plants where conditions are severe.

Fairbanks-Morse Publishes "Pioneers In Industry"

FAIRBANKS, Morse & Co., now celebrating its 115th year of industrial pioneering and believing that the story of its growth testifies to some of the benefits this country has derived from a system of free enterprise, has published its history in "Pioneers In Industry."

"Pioneers In Industry" (1830-1945), narrates, as has been stated, how Fairbanks, Morse & Co. has developed with the nation and has been privileged to help shape the nation's growth. Since 1830, when Thaddeus Fairbanks invented the weighing machine making it possible, for the first time in history, to record weights accurately, the organization has grown from a small business in Vermont employing less than twelve workers, to a company operating nine plants in many communities, manufacturing a diversified line of products essential to industry and commerce, employing thousands of workers and maintaining a vast network of branch offices in this country and throughout the world. Its products, first developed through the inventive genius of Thaddeus Fairbanks and the merchandising and industrial genius of Charles Hosmer Morse, have helped to meet and anticipate the needs of the country.


"Pioneers In Industry" is written against the background of America's history during the past 115 years and highlights the national vitality and ingenuity that has helped us to fight our way out of many dark periods of depression. Fairbanks, Morse & Co. had a role in this march of progress. Chapter IV points out that Charles Morse dared to lay the foundations of the company's western business in 1857, a year of financial and commercial depression. It was in 1893, a year of one of "the most disastrous financial panics in America," that the company decided to develop and promote the then novel and untested invention—the gasoline engine—in order to "lighten the load of labor on the

farm and turn the wheels of American industry." Again, in 1932, when popular belief held that America's "pioneering days were over" and free enterprise doomed, Fairbanks continued to blaze new industrial trails. Its Diesel engines, developed after 1932, gave "outstanding performance" during World War II.

The goal of Fairbanks, Morse & Co., in its development of new products, has been to introduce new efficiency, conveniences and comforts and raise the standard of living of the American

people.

Today, when the economic system of America is being reviewed, weighed and, by some groups, questioned, Fairbanks, Morse & Co. offers the history of how one company, through free enterprise, vision, faith, self reliance, inventiveness and organizing ability, has served the economic interests and welfare of this nation and the world. Our hearty congratulations to Fairbanks-Morse on a most outstanding presentation of its interesting history.

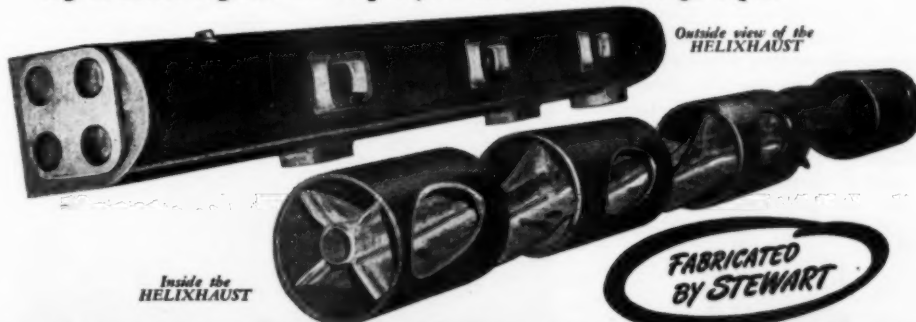



FOR YOUR DIESELIZATION PROGRAM DON'T OVERLOOK THE ADVANTAGES OFFERED BY THE... HELIXHAUST

WATER-COOLED MANIFOLD

● **TURBO-CHARGING** modernizes 4-cycle Diesels. The HELIXHAUST is new. It reduces temperature of exhaust gases—makes engine room livable. It increases permissible supercharged rating of Diesel engines. It's simple, yet

highly efficient, neater and more attractive. Get all the facts. Write Stewart for more details about the HELIXHAUST Water-Cooled Manifold as well as Intake Manifolds, Water Inlet Headers and Water Discharge Pipes.





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IRON WORKS CO., INC.**
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Centrifugal Pump Combination Foot Valve and Strainer Model 3100 Reversible Pump

DESIGNERS AND BUILDERS OF PUMPS FOR SPECIAL NEEDS. Famous for soundly engineered reliability, Marine Products has set a record for world-wide service and low maintenance costs. Use M-P equipment in your field.

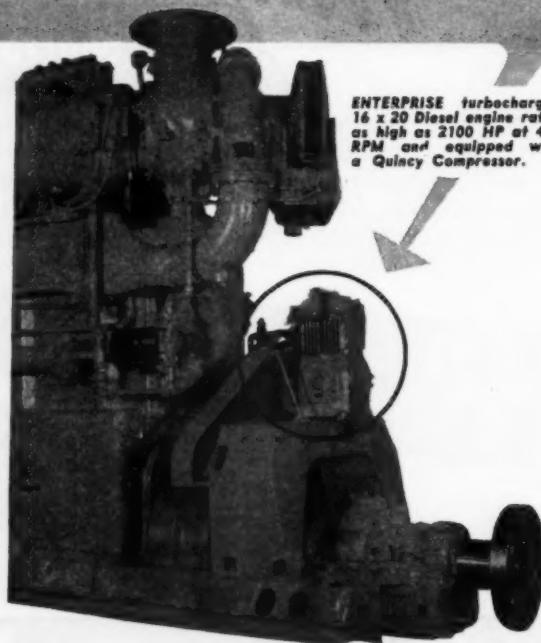
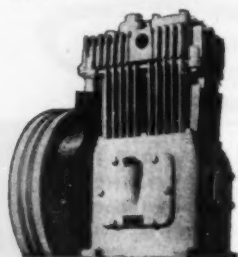
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Model 3600 Clutch and Pump Electric Pump

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DEPENDABILITY and compactness are compressor "musts" when Diesel engines are started by air power. Quincy offers a line of advanced design air compressors that are easily installed as an integral part of Diesel equipment. They can be relied upon for dependable starting power over a long, trouble-free service life. Sizes available from 1 to 80 cu. ft. displacement. Pressures up to 500 lbs. p.s.i. A Quincy compressed air specialist is ready to serve you. Ask him about your air problems.



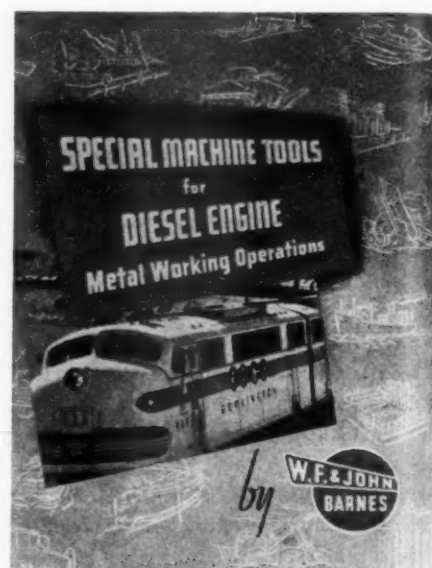
ENTERPRISE turbocharged 16 x 20 Diesel engine rated as high as 2100 HP at 420 RPM and equipped with a Quincy Compressor.

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Quincy, Illinois

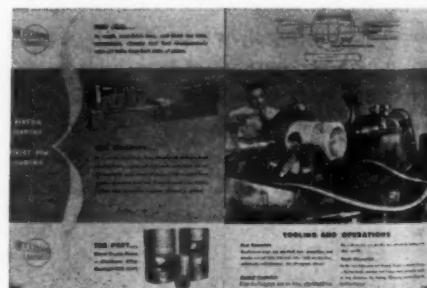
Branch Offices: New York • Chicago • St. Louis • San Francisco

Special Machine Tools for Diesel Engine Production

W. F. & JOHN BARNES has just completed an exhaustive study of specialized machine tools as applied to various operations in Diesel engine production and has published the results of this study in a most comprehensive booklet under the title, "Special Machine Tools for Diesel Engine Metal Working Operations." This 46-page booklet tells its story mostly with the use of outstanding illustrations showing each major operation for all of the principal types of Diesels and the particular machine tool best suited to the job.



Reproduction of the front cover of the Barnes Booklet.



Reproduction of a 2-page spread showing how the Barnes booklet covers a typical operation on Diesel parts.

Production of more intricate parts is further clarified through the use of drawings showing progressive operations and the machine setup for each operation. This constructive approach to the actual shop problems in Diesel engine manufacture is one of the finest ever offered the industry. The Barnes Company is to be congratulated on this excellent contribution. Every engine builder will want a copy of the booklet. Write W. F. & John Barnes Company, Rockford, Illinois, Dept. 59.

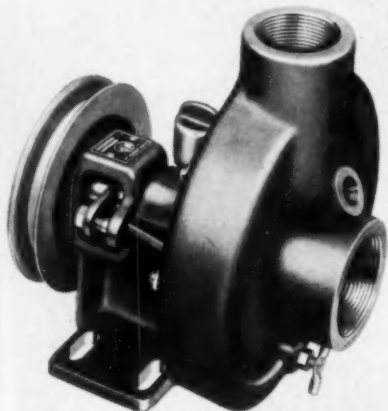
H. T. Brettelle Joins Grant Advertising



H. T. Brettelle

ADDITION of H. T. Brettelle to the Detroit staff of Grant Advertising, Inc., as an account executive, was recently announced. Before joining the Grant organization, Brettelle was with Detroit Diesel Engine division of General Motors, where he directed advertising and publicity work. He has been active in advertising and promotional work since coming to Detroit 22 years ago, and is a member of the Adcraft Club.

Reversible Centrifugal Pump



MARINE Products has announced a centrifugal pump which operates in either direction especially suited to direct application to reversible Diesel engines and other types of reversing machines. Built in two models these pumps feature compactness and efficiency with capacities ranging from 15 gpm. to 275 gpm. depending on head and speed of rotation. For full particulars write Marine Products Company, 6636 Charlevoix Ave., Detroit 7, Michigan, requesting Bulletin No. 3100-4100A.

The Diesel Engine Catalog

THE 1945 Edition of the DIESEL ENGINE CATALOG, Volume 10, is ready for distribution. It is the largest edition yet published—532 pages, hundreds of illustrations—a *Composite Catalog of the Entire Diesel Industry*. Page size 10 1/4 in. x 13 1/2 in.—a big book and a real value. A separate section devoted to each manufacturer's line of engines with completely illustrated descriptions and specifications—covering stationary, marine, automotive and rail-

way types. Other sections cover Diesel accessories such as fuel injection equipment, chain and gear drives, electric, hydraulic and mechanical couplings, superchargers and many other items. Also contains a directory of products and manufacturers. An indispensable book for all interested in Diesels. Paper restrictions limit the supply so order your copy promptly—price \$10, postpaid. Mail your order and check to *Diesel Engine Catalog*, 2 West 45th Street, New York 19, N. Y.



-THE NAME THAT

SAYS "QUALITY"

ON 3,000

TOOLS

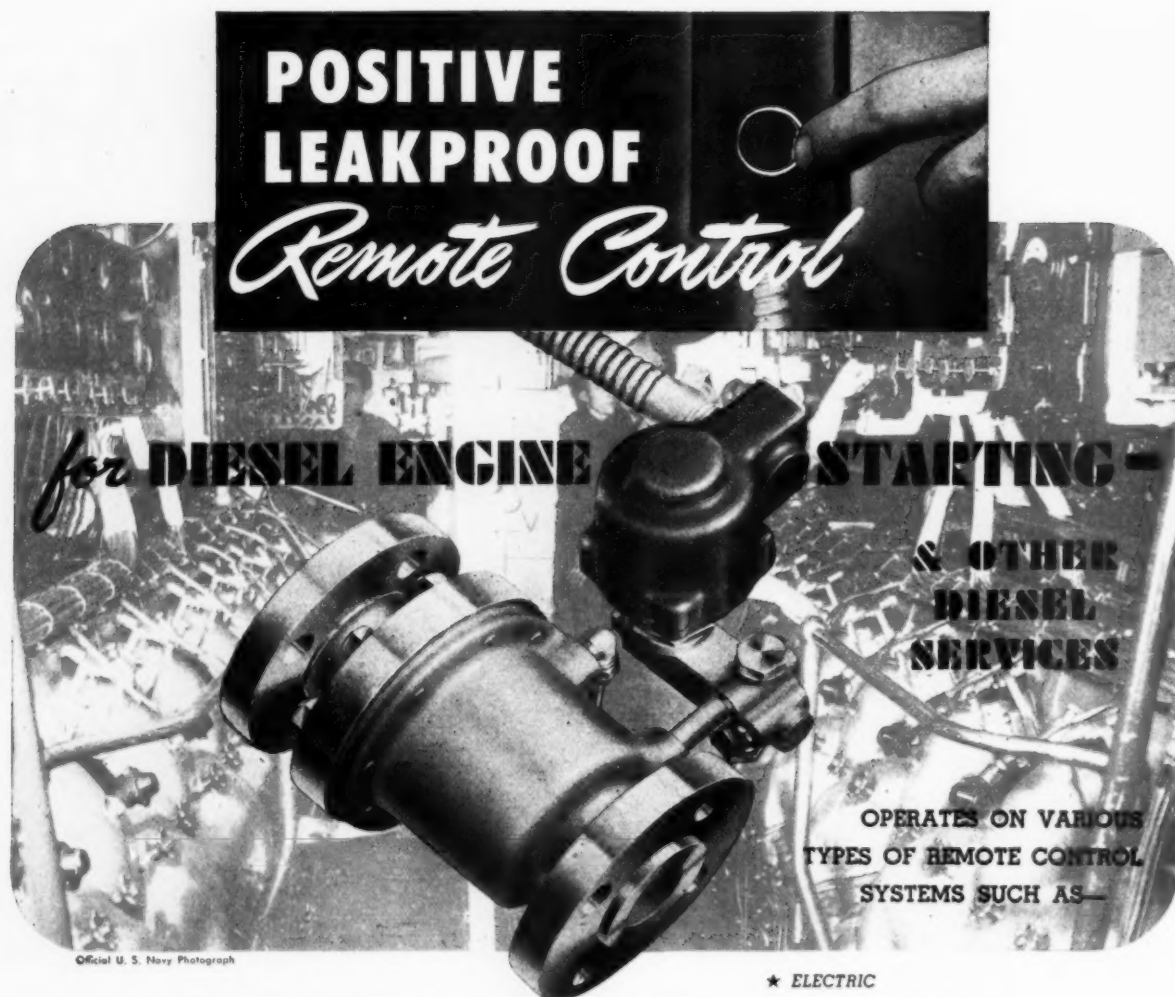
To a vast army of skilled mechanics the brief phrase, "It's a Snap-on", sums up all they care to know of tool quality. Better tools mean added earning power, and they know that the Snap-on name on any tool pays off in speed and accuracy, in dependability and durability. Not only are Snap-on tools "the choice of better mechanics", but they are the choice of industry, widely used in every phase of production, assembly and maintenance. Write for catalog of 3,000 Snap-on tools.

THIS UNIQUE, NATION-WIDE ORGANIZATION SERVES TOOL USERS EVERYWHERE

Snap-on's own distributing organization provides direct, personal service to tool users throughout America. Snap-on's branch offices and warehouses in 38 principal cities cover all major industrial areas. From factory branches a force of trained tool specialists bring Snap-on tools and service right to the work bench in shops and factories. The helpfulness and efficiency of this 25-year old service have won the endorsement of tool users everywhere. Write today for catalog and address of nearest factory branch.

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**POSITIVE
LEAKPROOF**
Remote Control

for **DIESEL ENGINE** **STARTING**
**& OTHER
DIESEL
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OPERATES ON VARIOUS
TYPES OF REMOTE CONTROL
SYSTEMS SUCH AS—

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Maximum flexibility of control is provided by Grove Flexflo Valves in the operation of large and smaller Diesel Engines. On Diesel starting, air is normally supplied instantly upon demand, but the Flexflo Valve is readily adjustable for retarded-opening in accordance with existing requirements. Being fully self-operating and utilizing **NO METALLIC** moving parts. This Expansible tube type valve delivers smooth, non-turbulent flow at capacities greatly in excess of conventional globe and other types of valves. Positive bubble-tight shut-off precludes the loss of air, fluids or gas. Remote operation is effected by any standard medium. Investigate fully, today.

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- ★ DIRECT PNEUMATIC
- ★ INDIRECT HYDRA-PNEUMATIC
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Although primarily employed for air-starting service Grove Flexflo Valves readily adapt themselves to many other Diesel applications such as in the Remote Control of: Cooling Water; Auxiliary Lubricating Oil; Fuel Oil; Gas; Gasoline, etc. For full details

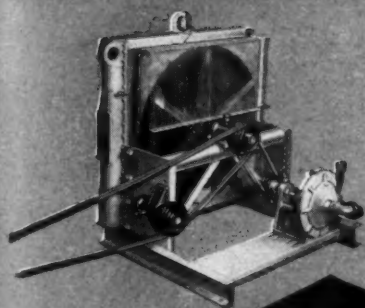
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GROVE *flexflo* DIESEL VALVE

GROVE REGULATOR COMPANY

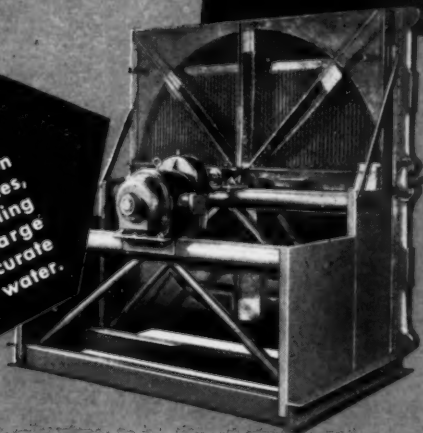
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WHAT IS YOUR COOLING PROBLEM?



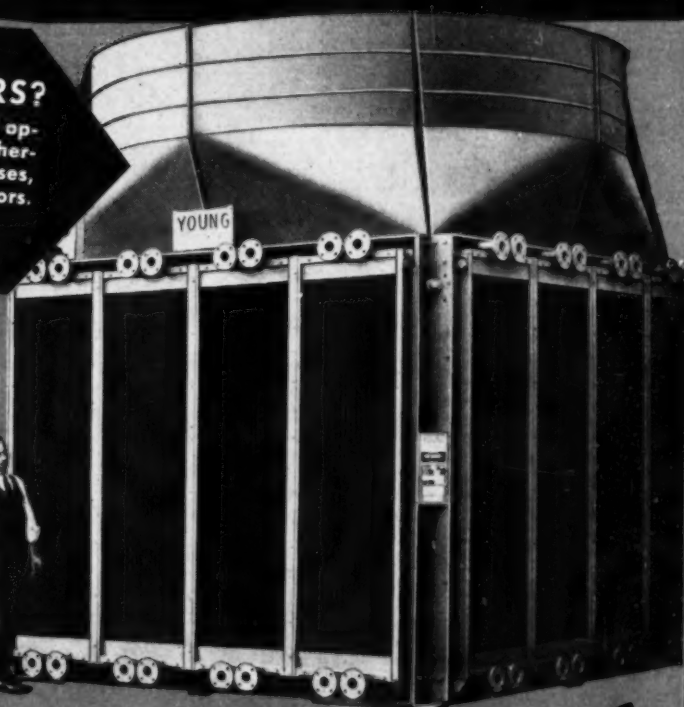
JACKET WATER COOLERS?

For cooling jacket water on gas, gasoline or diesel engines, or any similar liquid cooling function — made with large open channels for accurate but unrestricted flow of water.



"QUAD" COOLERS?

For maximum capacity and operating efficiency in atmospheric cooling of liquids and gases, or for condensation of vapors.



Tailored to fit your own particular needs, Young Cooling Equipment is available in every size . . . for every job. Evidence of a quarter century of cooling experience is found in the careful design and workmanship of each Young Heat Transfer Product. Whether your cooling requirements are large or small . . . for water, for gas, for oil, or air . . . there is a Young Cooler made of the right material, of proper strength and correct design. From the sturdy, compact lines of small engine jacket water coolers to the huge capacity and efficiency of "Quad" Coolers, the Young line meets every exacting test of performance and economy. Always in stride with developments in heat transfer science, Young engineers are ready to study *YOUR* needs first hand. Write today.

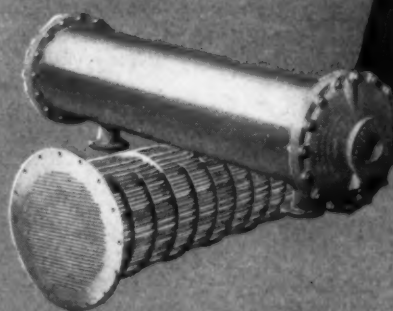
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HEAT TRANSFER PRODUCTS

OIL COOLERS • GAS, GASOLINE, DIESEL ENGINE COOLING RADIATORS • HEAT EXCHANGERS • ENGINE JACKET WATER COOLERS • UNIT HEATERS • INTERCOOLERS • CONDENSERS • EVAPORATORS • AIR CONDITIONING UNITS • HEATING COILS • COOLING COILS • CONVECTORS
And a Complete Line of Aircraft Heat Transfer Equipment.

HEAT EXCHANGERS?

Ideally suited to many applications — available in a range of sizes and either single or double pass. Features easy cleanability and free expansion and contraction of the tube bundle with temperature changes.



EVAPORATIVE COOLERS?

Used when wet bulb temperatures must be approached, as complete unit or in conjunction with atmospheric cooling tower. Low water make-up requirements.



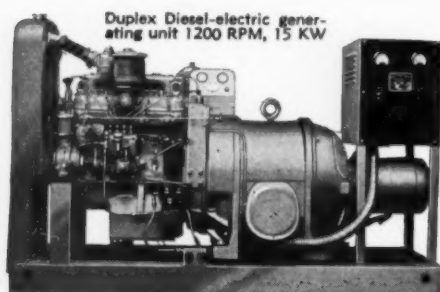
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Generating Units

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Close regulation of voltage and frequency is an outstanding feature of the generating units we build with either Diesel or gasoline prime movers. We are also equipped to supply any type of instrument panel required.

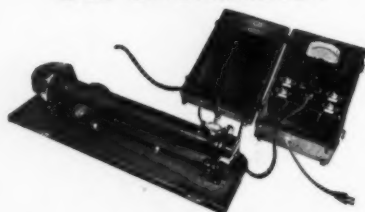
Manufacturers of engine generator sets for over 20 years.



Duplex Diesel-electric generating unit 1200 RPM, 15 KW

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Objective indication of smoke density, independently of human judgment and of light conditions.

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For Marine & Stationary
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PETROMETER
FOR TANK GAUGING EQUIPMENT FOR
DAY TANKS & CLEAN OIL STORAGE
PETROMETER CORPORATION
STAR SQUARE, LONG ISLAND CITY, N. Y.

WEST COAST DIESEL NEWS

By FRED M. BURT

THE new, 100-ft. tuna clipper *Miss America*, built by Hodgson-Greene-Haldeman Shipbuilders in Long Beach for Capt. Sebastian Silva, is powered with a supercharged, 400 hp. Enterprise marine Diesel engine plus three 55 hp. Caterpillar Diesels hooked up to 35 kw. General Electric generators for auxiliary power.

COMPLETED by Campbell Machine Co., San Diego, are the 144 ft. 8 in. wood, modified cruiser stern clippers *Triunfo*, *Bernadette*, *Mayflower* and *Senorita*. All have the same beam, 29 ft. and are similarly powered by 840 hp. super-charged Union Diesels; auxiliaries are a pair of 200 hp. Union Diesels connected to 125-kw. G.E. generators. Standby auxiliary is a 75 hp. Caterpillar Diesel, driving a 30 kw. G.E. generator.

POWERED with a Joshua Hendy Diesel, rated at 450 hp., is Olaf Johnson's 84 ft. *Astorian*. This six cylinder, 12 in. x 15 in. direct reversing engine turns a 62 in. x 35 in. Coolidge gun metal propeller at 450 rpm. The auxiliary is a Caterpillar Diesel driving a 50 kw. Westinghouse generator. This tuna bait boat was built in Seattle for an Oregon owner.

A POWERFUL, twin-screw river towboat for use on Alaska inland waterways, designed by H. C. Hanson, Seattle, is being powered with twin Diesels; Cummins 180 hp. super-charged units.

THE Mitchell Convalescent Hospital, U. S. Army, at Campo, Calif., near San Diego, uses three Worthington 340 hp. Diesel engines, with Westinghouse electrical equipment, as their power plant for pumping and lighting and

CASH IN ON YOUR IDEAS

For New Diesel Service Tools or
Specialties!

Reliable Midwestern manufacturer wants marketable new products to supplement present line of Diesel specialties. Complete protection on your patents or patentable products, plus active sales promotion guaranteed.

Write today, briefly outlining your idea and its probable market. Send no drawings, blue-prints or models until requested. Address: Box 150, DIESEL PROGRESS, 2 W. 45th Street, New York 19, N. Y.

Atlantic Seamless Flexible Metal Hose

Highly recommended by leading Diesel Engine Manufacturers, Naval Architects and Engineers for

Diesel Exhaust and Air Intake

Absorbs vibration. Can't leak or burn out. No joints to loosen. No packing to rely on for tightness. In sizes 1" to 36" I.D., inclusive. With forged steel flanges or nipples in lengths desired, straight or bent to your specifications. Atlantic Hose is widely used in Industrial Plants, on Railroads, in Marine service and by the United States Navy.



For complete information write for our Bulletin 10-B.

ATLANTIC METAL HOSE CO., Inc.
102 W. 64th STREET
NEW YORK

FACTORY SUPERINTENDENT WANTED

Here is an excellent opportunity for an experienced Diesel production man who is a good organizer and can get out the horsepower. He must have the background to take charge of a large modern midwestern plant. In a letter, which will be held in strict confidence, give complete details of your experience and other pertinent information. Personal interviews will be arranged with all those with necessary qualifications

Address Box 153
c/o Diesel Progress
2 West 45th Street
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VIBRATION ISOLATOR
All Purpose—All Directional

KORFUND
VIBRATION
CONTROL

For controlling both vertical and lateral vibration in stationary or marine applications. Write for complete details.

THE KORFUND COMPANY, Inc.
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Representatives in Principal Cities

Stop ALL Leaks

SERVING THE
UNITED NATIONS
WITH DEPENDABLE
GASKETS FOR EVERY APPLICATION

DETROIT GASKET & MFG. CO.
DETROIT 23, MICH.



minor miscellaneous uses. When a forest fire burned out the power lines of the Rural Electrification Authority supplying nearby areas, they hooked on to the hospital power until repairs were made.

BELLINGHAM (Wash.) Iron Works is converting 8,800 ton S.S. *Mormacrey* into a floating cannery and mother ship for a fleet of trawlers. New installations include three 150 hp. Enterprise Diesels, driving three 300 kw. generators to supply electrical power for ice making, refrigerating equipment.

FROM the Prothero Yard, Seattle, comes the *Coral Sea*, 53 ft. 8 in. by 14 ft. 6 in. by 6 ft. 11 in., with Troll-and-Tuna convertibility for Capt. Wm. D. Bruce; the main power is a 165 hp. Gray Marine Diesel, equipped with Sperry hydraulic governor control.

ROSE ANN, 62 ft. baby tuna clipper, for Joe Tarrantino and sons, by North American Shipbuilding Corp., Newport Beach, Calif., has a 155 hp., 4 cyl. Atlas Imperial Diesel as main engine; to save space, a 15 kw. Caterpillar Diesel generating set is mounted on top of a 30 kw. Caterpillar set, for auxiliaries.

INSTALLED by Gunderson Bros. Equip. Corp., Portland, in the 42 ft. trawler *Nell*, owned by Henry Reinertsen, a 110 hp. Gray Marine Diesel engine, at 1850 rpm. developed 9½ knots loaded with 6½ tons or 1100 tuna, caught on the maiden run of 21 hrs. out of Newport, Ore.

A NEW 178-ft. welded steel Diesel freighter for Puget Sound Freight Lines, Carl J. Nordstrom, Seattle designer, Reliable Welding Works, Olympia, builders, will have a 6-cyl. 16 x 20, 1200 hp. Fairbanks-Morse, direct reversible, 2-cycle Diesel engine, driving an 8-ft. solid bronze propeller.

DIESELS

ALL SIZES TYPES

A. G. SCHOONMAKER CO.

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BUSINESS ESTABLISHED 1896

The New AUTO-DIESEL GAPLESS PISTON RING!



The AUTO-DIESEL Helicam GAPLESS Piston Ring is the first basic improvement in piston rings in many years and is destined to set a new and higher standard in piston ring performance. The ring consists of two IDENTICAL parts that interlock when completely assembled and forms a ring without a gap. There is positive seal with no chance of blow by and this results in the greatest possible compression. The illustration shows the ring semi-assembled. Made in sizes from 1" to 36" for all industrial operated equipment—stationary and mobile.

Write for Information

THE AUTO-DIESEL PISTON RING CO.
3151 SUPERIOR AVE. CLEVELAND 14, OHIO

QUALITY RINGS SINCE 1921

MANZEL FORCE FEED LUBRICATORS



provide
TROUBLE-FREE LUBRICATION

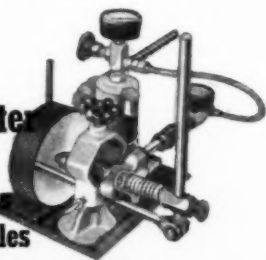
Manzel Lubricators are famous for their positive, dependable operation. The knowledge gained in nearly 50 years of building lubricators, exclusively, results in a simple, correctly designed lubricator that provides dependable lubrication under the most severe conditions. Leading Diesel engine manufacturers use Manzel Lubricators as standard equipment.

Write for Catalog 94-B.

★ MANZEL BROTHERS CO.
275-277 Babcock St., Buffalo 10, N. Y.

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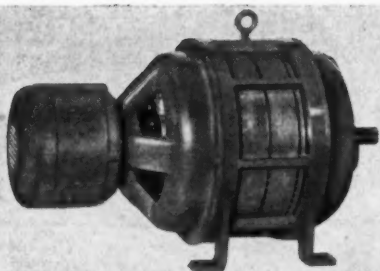
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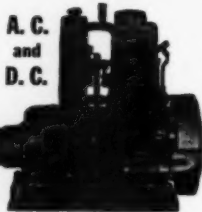
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TWO 50 hp. Lorimer Diesel generating sets flank the 200 hp. Lorimer main engine in the engine room of new, \$100,000, 65-ft. baby tuna clipper *Sea King*, added to his fleet of ocean sport fishing boats at Newport Beach, Calif. by Darrell W. King.

VIRGIL STRONG, Eureka fisherman, is installing a 250 hp. Cummins Diesel engine, purchased from Watson & Meehan, San Francisco, in his 65-ft. combination boat.

FORTY-EIGHT ft. tug *Telco*, owned by Pacific Telephone & Telegraph Co., San Francisco, is being re-powered with a 115 hp. Caterpillar Diesel engine at the Alameda yards of W. F. Stone & Son.

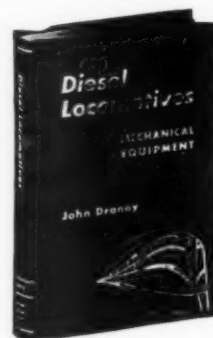
BUILT by North American Shipbuilding Corp., Newport Beach, *La Belle*, 62 ft. tuna boat, has as main engine, a 154 hp. 6 cyl. Buda Diesel turning the wheel at 270 rpm. Auxiliary is Caterpillar 35 hp. Diesel driving a 20 kw. generator.

PURSE seiner *Sea Spray* logged 10 knots for 1,800 miles in nine days, with 93 tons of tuna; power, propulsion and auxiliary, from 400 hp. Enterprise Diesel.

THREE former R.C.A.F. vessels have been taken over by the Canadian Fisheries Dept. and are 60-ft. long, powered with 165 hp. Gray Marine Diesels. They will be used for fish patrol.

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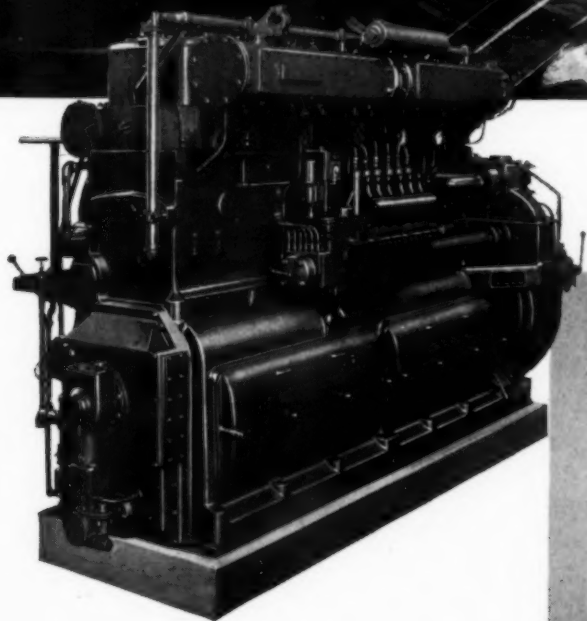
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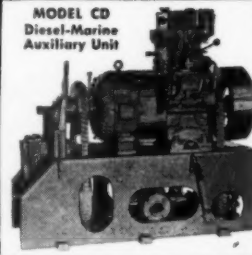
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